# BEST AVAILABLE COPYAttorney's Docket No.: 16441-012002

## THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: John Christian Hermansen et al. Art Unit: 2641

Serial No.: 10/055,178 Examiner: Joon H. Hwang

Filed : January 25, 2002

Title : SYSTEM AND METHOD FOR ADAPTIVE MULTI-CULTURAL SEARCHING

AND MATCHING OF PERSONAL NAMES

## MAIL STOP AMENDMENT

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

## DECLARATION IN RESPONSE TO THE REQUIREMENT OF 37 CFR § 1.105

This declaration is prepared in response to the 37 C.F.R. § 1.105 requirement in the Office Action mailed on October 21, 2004.

I, the Declarant, am one of the named inventors on U.S. Patent Application No. 10/055,178, in which an office action was mailed on October 21, 2004. The Office Action includes a 105 requirement relating to (i) PC-NAS and (ii) products and services of Language Analysis Systems, Inc. ("LAS").

The present application, as-filed, included a paragraph asserting to describe PC-NAS, stating in part that "The assignee has developed a software program known as PC-NAS. An early version of this program was incorporated into a government computer system more than one year before the priority date of this application." Specification at page 5, lines 11-13. This statement is inaccurate for at least the reason that PC-NAS was not incorporated into a government computer system more than one year before the priority date of this application. Because the statement was inaccurate, I, through my patent attorneys, removed the PC-NAS paragraph from the specification in an amendment filed on April 12, 2004.

An investigation into LAS's products and services was performed that involved me, at least one other individual at LAS, and my patent attorneys. The purpose of the investigation was to determine which, if any, of LAS's products and services were prior art to the present application or should otherwise be disclosed to the U.S. Patent & Trademark Office ("PTO"). In the course of the investigation, we determined that PC-NAS had never been disclosed outside of LAS.

Applicant: John Christian Hermansen et al.

Serial No.: 10/055,178 Filed: January 25, 2002

Page : 2 of 3

During the investigation, however, we did determine that four products/services of LAS should be disclosed to the PTO. These four are: (i) Arabic Name Classifier, (ii) Arabic Name Analyzer, (iii) Consular Lookout And Support System, and (iv) Distributed Name Check. These four products/services are each described and disclosed in another Declaration by me that was filed in the present case on July 13, 2004, as part of an Information Disclosure Statement.

Attorney's Docket No.: 16441-012002

I am aware that the website www.archive.org (the "archive website") has a number of documents purporting to be archives of the LAS website on various dates. I do not know whether or not these documents are accurate. The archive website includes four documents, and only four, that are dated prior to March 25, 1998, which is the priority date of the present application. The dates of the four documents, according to the archive web site, are: 2/1/1997, 7/11/1997, 10/21/1997, and 2/6/1998. The Examiner notes in the 105 requirement that the 10/21/1997 document on the archive website describes a Suite of Tools including NameCheck, NameClassifier, NameRegularizer, Intelligent Search Data Generator, and PhoneticNameKey tools. The Examiner requests disclosure relating to these tools.

During the investigation I reviewed printouts of all four of the www.archive.org documents dated prior to March 25, 1998. During my review, I noticed that the oldest two documents did not contain material describing the Suite of Tools mentioned by the Examiner. That is, the Suite of Tools first appeared in the 10/21/1997 document, and does not appear in either the 2/1/1997 document or the 7/11/1997 document. Accordingly, the Suite of Tools is not in a document having a date one year prior to the priority date. Further, to the best of my knowledge, the Suite of Tools was not disclosed outside of LAS more than one year prior to March 25, 1998.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Applicant: John Christian Hermansen et al.
Serial No.: 10/055,178
Filed: January 25, 2002
Page: 3 of 3

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Attorney's Docket No.: 16441-012002

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Attorney's Docket No.: 16441-012001

N THE UNITED STATES PATENT AND TRADEMARK OFFICE.

Applicant: John Chrisitan Hermansen et al. Art Unit: 2172

Serial No.: 09/275,766 Examiner: Joon H. Hwang

Filed: March 25, 1999

Title : SYSTEM AND METHOD FOR ADAPTIVE MUTLI-CULTURAL SEARCHING

AND MATCHING OF PERSONAL NAMES

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

## DECLARATION OF JOHN CHRISTIAN HERMANSEN

This declaration relates to the following systems: Arabic Name Classifier ("ANC"), Arabic Name Analyzer ("ANA"), Consular Lookout And Support System ("CLASS"), and Distributed Name Check ("DNC").

## ANC

To the best of Declarant's recollection, ANC was written as a design document and delivered to a customer no later than the end of 1996.

ANC accepted a romanized input name and a COB associated with the input name, and produced a binary result indicating whether the input name was considered to be Arabic. Specifically, ANC determined a single surname for the input name, and compared that surname against a list of surnames that were known both to be from the COB and to be Arabic. If there was an exact spelling match, then ANC determined that the input name was Arabic and reported this determination to a user. If there was not an exact match, then ANC (i) performed a digram analysis on the input surname to determine the digrams present, (ii) produced an indicator of the similarity between the digram analysis and digram results for Arabic surnames from the COB, (iii) compared the value of the indicator to a threshold value representing confidence in the similarity and, based on this comparison, produced a binary result indicating whether the input name was considered to be Arabic, and (iv) reported the binary result to a user.

## ANA

To the best of Declarant's recollection, ANA was written as a design document and delivered to a customer no later than the end of 1996. ANA accepted a romanized input name

Attorney's Docket No.: 16441-012001

Applicant: John Christian Hermansen et al.

Serial No.: 09/275,766 Filed: March 25, 1999

Page

2 of 4

known to be Arabic, and applied various modification rules to a single surname of the input name. The rules were based on known spelling differences in Arabic surnames, and application of the rules produced a resulting surname which could be different from the surname of the input name. ANA then produced a key representing the resulting surname, and the key could be used to pull names from a database.

## CLASS

To the best of Declarant's recollection, no later than the end of 1991 (i) according to the terms of a contract with the United States government, and for compensation, Language Analysis Systems provided a design to the United States government in the United States of America proposing linguistics processing features for CLASS, (ii) according to the terms of a contract between another party (not Language Analysis Systems) and the United States government, and for compensation, CLASS was implemented in software by the other party, with the implementation generally following the proposed design from Language Analysis Systems, and CLASS was provided to the United States government in the United States of America, and (iii) CLASS was operated on a mainframe in the United States of America and accessed by terminals in one or more foreign countries.

CLASS accepted an input name and determined a rank-ordered list of name; from a database, where the names in the list were considered to be possible matches for the input name. More specifically, CLASS:

- (1) received the input name and various related or corresponding inputs including one or more "compressed name" ("CN") key(s) for corresponding sumame(s), a corresponding COB, a corresponding date of birth ("DOB"), and possibly a corresponding state of birth,
- (2) identified component elements of the input name (e.g., surname and given name), and identified a first initial of the given name,
- (3) identified digrams within each separate component element of the input name ("input name digrams"),
- (4) derived a set of names from within a database for comparison to the input name, the set of names being derived based on the input name, the one or more CN keys, the DOB, and the first initial of the given name,

Applicant: John Christian Hermansen et al.

Serial No.: 09/275,766 Filed

: March 25, 1999

Page

: 3 of 4

Augmey's Docket No.: 16441-012001

(5) identified digrams for the component elements of the names in the set of names ("database name digrams").

- (6) selected a set of weighting rules for producing a score indicating the extent to which two names matched each other, the set of weighting rules being selected based on the COB of the input name,
- (7) compared the input name with each name in the set of names, the comparison including comparing the input name digrams to the database name digrams,
- (8) generated a metric for each name in the set of names by applying the set of weighting rules during the comparison of the input name with each name in the set of names,
- (9) rank-ordered all names in the set of names having a metric greater than a threshold score, the threshold score indicating that the input name matches a particular name from the set of names, and
  - (10) provided the rank-ordered names to the user.

The set of weighting rules assigned various points to a particular name in the set of names based on a comparison of the particular name and the input name. For example, various points might be assigned depending on whether (i) corresponding element(s) in the particular name and the input name had similar digram results, (ii) the length of one or more elements was the same in the particular name and the input name, (iii) the DOBs of the particular name and the input name were within a predetermined timeframe of each other, (iv) the COB of the input name was the same as the COB associated with the particular name, (v) the elements of the particular name and the input name were in the same order, and (vi) the state of birth was the same for both the particular name and the input name.

## DNC

To the best of Declarant's recollection, no later than February 1997 (i) according to the terms of a contract with the United States government and for compensation, DNC was developed by Language Analysis Systems as a computer program and delivered by Language Analysis Systems to the United States government in the United States of America, and (ii) DNC was operated in one or more foreign countries. DNC was similar to CLASS, as described above. except that (i) DNC did not receive or use a key for the surname(s) of the input name, (ii) DNC

Attorney's Docket No. 16441-012001

Applicant: John Christian Hermansen et al.

Serial No.: 09/275,766 Filed: March 25, 1999

Page : 4 of 4

derived the set of names based on the DOB, the COB, and the state of birth (if available), and without reference to a key or the first initial of the given name, and (iii) DNC ran on a personal computer and not on a mainframe, so that when operated in a foreign country DNC only ran on a personal computer in the foreign country and not on a mainframe in the United States of America.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

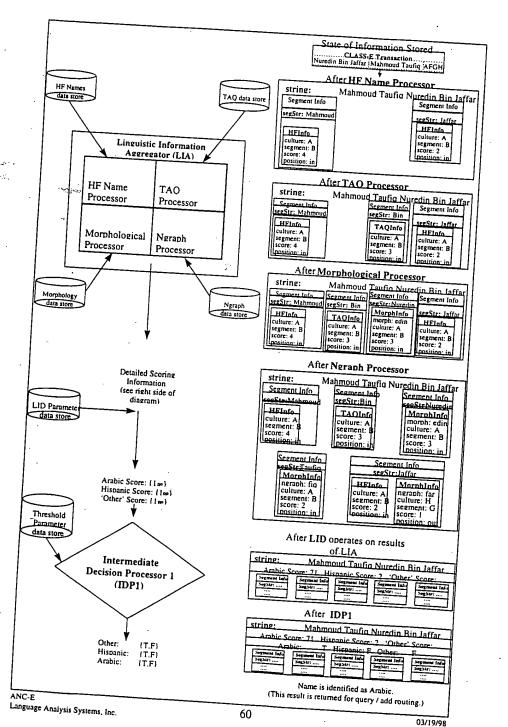
Respectfully submitted.

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John Christian Hermansen

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## SOFTWARE DESIGN DESCRIPTION AUTOMATIC NAME CLASSIFIER FOR CLASS-E (ANC-E)

#### INTRODUCTION

. 1.

rolel. Project Background

1.1.1. Legacy Consular Lookout And Support System (CLASS) and CLASS-E

The Consular Lookout and Support System (CLASS) performs namechecks of visa and passport applicants in support of the issuance process. Used by United States passport agencies, consulates, and border inspection agencies, CLASS serves as an automated index to manual files. CLASS is a centralized system residing on mainframe computers at the Department of State in Washington, DC. The Bureau of Consular Affairs, Consular Systems Division (CA/EX/CSD) of the Department of State (DOS) has responsibility for development, maintenance, and operation of CLASS.

CLASS was implemented in 1989; since that time, major advancements have occurred in database management systems, large-scale computers and their operating systems, and data telecommunications. In addition, namematching techniques have also evolved based on the DOS's experience with the system and further linguistic research. This has led DOS in determining the necessity for a newer, more modernized system, CLASS-E (Consular Lookout and Support System-Enhanced).

The CLASS-E modernized version of automated name-matching will incorporate state-of-the-art hardware, data telecommunications, and database management technology to migrate the CLASS application from its Virtual Storage Access Method (VSAM) environment into a DB2 relational database system. In addition to providing virtually uninterrupted access to the lookout databases 24 hours a day, 7 days a week to the VO, PPT, overseas posts and support users, this enhanced system will position CLASS-E to incorporate advanced culturally-sensitive namecheck methods.

1.1.2. Culturally Sensitive Name Searching in CLASS-E
Personal naming systems vary widely from culture to culture. That is,
names from around the world do not necessarily fit cleanly into the

Anglophone name model. Several of the manifestations of these differences are

- · Anglicization of Non-English sound patterns (Mladevic written as Miladevich)
- · Variant romanization schemes (Arabic Waseem ~ Ouassime, Shareef ~ Cherife; Chinese Xia ~ Hsia ~ Sya
- Dialectal variants (Arabic Abu Bakir [Egyptian] ~ Boubker [Moroccan]; Chinese Wu [Mandarin] ~ Ng [Cantonese, Fukien])
- · Variant roman spelling conventions (French silent letters, German sch for English sh)

When dealing with Arabic and Chinese names and those of other languages that do not use the Roman alphabet, foe example, one quickly discovers one major source of name variation lies in how names are transliterated into roman characters from the original scripts. For both Arabic and Chinese, there are numerous competing transliteration standards, as well as less formal traditions. Xia, Hsia, and Sya, for example, are all romanized variants of the same Chinese name. Kassim, Qasim, Casem, Kacem and Asim are romanized variants of the same Arabic name. In Arabic, name variation often goes beyond the phonetic level. Analyzable elements such as "Abu" show up in many different forms, depending on dialect (e.g., Abu Bakir ~ Boubker). In Chinese, multiple traditions of transliteration are one of the sources of name variation; dialect issues also abound (e.g., Wu ~ Ng). Hispanic names, which make up the largest portion of the data base, place information value on name parts in a manner that is not consistent with Anglophone naming conventions. Exploitation of this culturally-specific information in the name search process leads to improved precision, recall, and overall system performance.

## 1.1.3. Automatic Name Classifier-E (ANC-E) in CLASS-E

The need for automatic name classification has become a become an undisputed necessary first step in the process of applying linguistic knowledge to solve the problems associated with name searching in large multicultural databases. In this environment, name classification serves as a means of routing queries to the proper language- and culture-specific algorithms. Currently, Legacy CLASS supports a single module, called ANI, which begins to address this need by returning a Boolean value indicating whether a name is or is not Arabic. If a name qualifies as Arab, it is subject to processing by an initial implementation of the Arabic algorithm designed by LAS for the State Department. Currently the expanding needs of the State Department are being addressed in the development a second culture-specific algorithm which will handle Hispanic names. The addition of a Hispanic algorithm to CLASS's

functionality requires the addition of a method for identifying Hispanic names in a manner similar that of ANI.

At this juncture, it is reasonable to turn enhancement efforts towards the development of a single, integrated, expandable algorithm for name classification which will address the need for classifying Arabic and Hispanic names, and which will anticipate the imminent addition of other languages. The integrated automatic name classification algorithm will represent a significant improvement over the existing ANI algorithm in that it will incorporate more linguistic knowledge, it will allow for future expansion with minimal coding effort, and it will allow information about a record's country of birth (COB) to contribute to the query routing decision. Figure 1-1 displays the integration of ANC-E within the CLASS-E system.

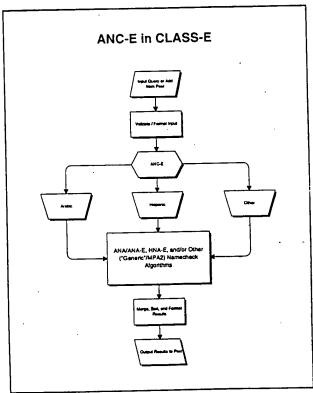


Figure 1-1

#### 1.2. Scope

This document describes the linguistic motivation, requirements, and high level design for an Automatic Name Classifier (ANC) which will automatically determine whether a name qualifies as Hispanic or Arabic. The document's purpose is to provide information about the proposed design in order to facilitate the analysis and planning necessary to prepare for eventual implementation.

Intended to serve as the module that will provide for the integration of the enhanced Arabic Name Search Algorithm for CLASS-E (ANA-E) and the Hispanic Name Search Algorithm (HNA-E) into the overall CLASS-E architecture, the Automatic Name Classifier for CLASS-E (ANC-E) will provide the capability to automatically determine whether an input name is Arabic, Hispanic, or neither. In this system, names may be qualified as Arabic or Hispanic by virtue of passing one of two thresholds, or, conversely, may be disqualified as Arabic or Hispanic by virtue of having many characteristics of 'Other' types of names. The ANC-E system has been designed with an open architecture intended to facilitate the inclusion of additional cultures in the event that CLASS-E adds other culture-specific search algorithms in the future. Furthermore, since the ANC-E is data-driven, it is possible to tune its level of sensitivity for each individual culture being identified.

In CLASS-E the concept of the Legacy CLASS Multi-Pipe Architecture will be carried forward to include a distinct Arabic processing algorithm and a distinct Hispanic processing algorithm as well as perhaps others in the future. The type of processing to which an input name will be submitted will be a business decision of CA/EX/CSD and may to some degree be dependent on the impact that multiple processing of an input name would have on the performance of the system. It is likely that input names that are classified by the Advanced Name Classifier for CLASS-E (ANC-E) will be submitted to multiple of the following processors: the generic CLASS-E generic processing algorithm, the DOB processing algorithm, the ANA-E algorithm, and the HNA-E algorithm. The ANC-E will provide a determination as to which culture or cultures a name belongs; what use is made of this determination is a business decision of CA/EX/CSD. This decision will affect the design of the interface between the ANC-E and the rest of the CLASS-E system.

## 1.3. Definitions and Acronyms

## 1.3.1. Definitions

Affix\*

A name particle which is neither a title nor a qualifier. Affixes in the ANC-E are defined as being delineated by white space; for example,

ANC-E Language Analysis Systems, Inc.

'de' in 'Tirso de Molina'. Note that, contrary to normal usage within linguistics, affixes are in contrast to (bound) morphemes, which are

not delineated by white space.

Digraph Field

A two character n-gram.

A data entry mechanism which allows the user to input a fixed number of characters. The fields typically referred to in the CLASS environment are the Given Name Field and the Surname Field.

environment are the Given Name Field and the Surname Field

Given Name

Note that it is important to distinguish between given name and surname data entry Fields and given name and surname data elements, since data elements do not always occur in the proper field.

The portion of a name which uniquely identifies an individual member of a family, as opposed to surname. Given Names may include one or more segments; for example, 'Mary Jane' in 'Mary

Jane Cassoway'.

Infix

" Dies

ء المفتد

41.77

A substring occurring the middle of a name segment, but not at the

edges. Both n-grams and morphemes may be infixes.

Morpheme

(here, bound morpheme) A meaningful, variable length substring of a name segment. Morphemes may occur as prefixes, infixes or suffixes.

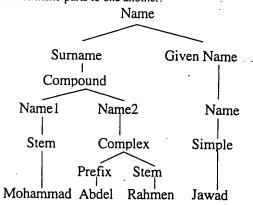
Examples: '-ovitch' in 'Berkovitch'. Note that morphemes contrast

with affixes.

Morphology Name

Referring to morphemes.

The general term referring to the entire collection of segments which refer to a single person. A name may include one or more given names, one or more surnames and zero or more particles. For the purposes of ANC-E, a Name is considered to consist only of alphabetic characters and white space. The diagram below illustrates the relation of name parts to one another:



N-Gram

A variable length sequence of characters which serves as a useful

<sup>\*</sup> Note that these terms have a slightly modified or restricted definition within the context of ANC-E.

indicator of linguistic affinity, but which is not associated with a meaning. N-Grams may be considered to be indicators of the sound or spelling patterns of a language; for example, -ez is a Hispanic N-

Gram.

Particle

141.14

A functional name element delineated by white space. Titles, affixes and qualifiers are the three kinds of particles identified in the ANC-E

algorithm.

Prefix A substring (N-Gram or morpheme) or a particle (affix) occurring at

the beginning of a name segment.

Qualifier A meaningful particle which represents a kinship relation or earned

social status; for example, Jr. or Ph.D. Qualifiers typically occur at

the end of a name field.

Segment Any element within a name which is delineated by white space.

Suffix A substring (N-Gram or morpheme) or a particle (affix) occurring at

the end of a name segment.

Surname The portion of a *name* which may indicate family membership, as opposed to *given name*. Surnames may include one or more segments

and zero or more particles; for example, 'Fernandez de la Puente' in

'Hector Fernandez de la Puente'.

Syntax The rules governing the order of name elements.

Title A meaningful particle which represents a term of address and which

typically occurs at the beginning of a name field. Examples: Dr. or

Sir. Titles may be indicative of social position.

Trigraph A three character n-gram.

Variant An alternate spelling of a name segment; for example, Mohammad

6

and Muhamed are variants of one another. Variants may be predictable, as in this example, or unpredictable, as evidenced by

typographical or other data entry errors.

#### 1.3.2. Acronyms

ANA Legacy Arabic Namecheck Algorithm

ANA-E Arabic Namecheck Algorithm for CLASS-E

ANC-E Automatic Name Classifier for CLASS-E

ANI Arabic Name Identification (of Legacy CLASS ANA)
ANR Arabic Name Regularization (of Legacy CLASS ANA)

AOR Application Owning Region
ARTP Acceptance/Regression Test Plan
ARTR Acceptance/Regression Test Report

BIMC Beltsville Information Management Center

C/CE CLASS to CLASS-E
CA Bureau of Consular Affairs

ANC-E Language Analysis Systems, Inc.

CA/EX/CSD Consular Affairs, Consular Systems Division Consular Affairs Experimental (Development) CAX

Configuration Control Board CCB Configuration Change Request **CCR** Critical Design Document CDD Critical Design Review CDR CLASS-Enhanced CE

**CICS** Customer Information Control System Consular Lookout and Support System **CLASS** 

Consular Lookout and Support System-Enhanced CLASS-E

Configuration Management CM

Complementary Metal Oxide Semiconductor **CMOS** 

COB Country of Birth

Contracting Office Representative COR Computer Systems Division **CSD** 

**DBMS** Database Management System DB2 IBM's relational database

Digraph Information Aggregator (of ANC-E) DIA

DNC Distributed Namecheck

Date of Birth DOB DOS Department of State

Functional Requirements Review FRR Functional Requirements Specification **FRS** 

Hispanic Namecheck Algorithm for CLASS-E HNA-E

**IBIS** Interagency Border Inspection System

Intermediate Decision Processor 1 / 2 (of ANC-E) IDP1/IDP2

ΙP Installation Plan

**IVV** Independent Verification and Validation

Linguistic Information Aggregator (of ANC-E) LIA

LID Linguistically Informed Decision Processor (of ANC-E)

LQA Linguistic Quality Assurance

Linguistic Quality Assurance Report LQAR

Linguistic Support Plan LSP Linguistic Trace Facility LTF

NC Namecheck

PC **Production Control PMP** Project Management Plan PPP

Post Phase-In Plan

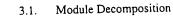
ANC-E Language Analysis Systems, Inc.

Passport Office PPT Parallel Transaction Server PTS Quality Assurance QΑ Query Management Facility QMF Query Routing Processor QRP SA-1 State Annex-1 Software Engineering Standards and Procedures SESAP Title, Affix Qualifier TAQ\_ Test Incident Report TIR Terminal Owning Region TOR Test Readiness Review TRR Visa Office VO Virtual Storage Access Method VSAM

## 2. References

- 2.1. CLASS-E Project Management Plan (PMP)
- 2.2. CLASS-E Functional Requirements Specification (FRS)
  - 2.2.1. Note: the CLASS-E FRS has not yet been finalized.

#### Decomposition Description 3.



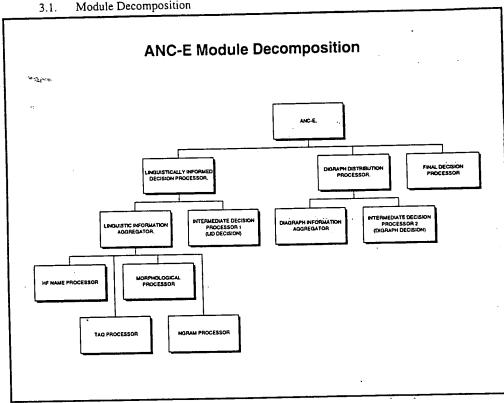


Figure 3-1

- 3.1.1. Automatic Name Classifier for CLASS-E (ANC-E) Module Decomposition
  - 3.1.1.1. Identification

This program is referred to as the Automatic Name Classifier for CLASS-E (ANC-E).

3.1.1.2. Type

ANC-E is a program that is part of the larger CLASS-E system. It can be viewed as a "shell" program in that it is to

serve as a layer surrounding all of the culturally-specific name search algorithms implemented in CLASS-E.

## 3.1.1.3. Purpose

- 3.1.1.3.1. The need for automatic name classification is a necessary first step in the process of applying linguistic knowledge to solve the problems associated with name searching in large multicultural databases.
- 3.1.1.3.2. In the CLASS-E environment, name classification serves as a means of routing queries to the proper language- and culture-specific algorithms.
- 3.1.1.3.3. In addition to the rudimentary identification of Arabic names currently implemented in ANI, the addition of a Hispanic name search algorithm to CLASS-E's functionality requires the addition of a method for identifying Hispanic names.
- 3.1.1.3.4: ANC-E is a single, integrated algorithm for name classification which will address the need for classifying Arabic and Hispanic names, and which will anticipate the possible addition of other languages.
- 3.1.1.3.5. This integrated automatic name classification algorithm will represent a significant improvement over the existing ANI algorithm in that it will incorporate more linguistic knowledge, and will allow information about a record's country of birth (COB) to contribute to the query routing decision.

## 3.1.1.4. Function

- 3.1.1.4.1. The ANC-E will take as input a surname, given name, and COB in standard CLASS-E format.
  - 3.1.1.4.1.1. There are two options with respect to the methodology for handling an input name and gathering the aggregate data

that will lead to the determination of cultural affinity for that name.

## 3.1.1.4.1.1.1. If ANC-E is to be implemented in an objectoriented environment, an object can be created which will contain all of the accumulated information to be used in the determination of cultural affinity. This object travels through the ANC-E system, thus allowing access to the accumulated information at any time. If ANC-E is integrated with the culturally-sensitive name search algorithms in CLASS-E, this option has the advantage that the all of the attendant linguistic information produced by ANC-E processing could be passed, along with the name, to the culturally-sensitive namecheck algorithm for further processing. That is, certain common linguistic processing would need to be performed only one time for the entire namecheck process, rather than once for each specific name search

3.1.1.4.1.1.2. If ANC-E is to be implemented in a non-object-oriented environment, ANC-E will process the name and COB as separate string values, and will output a either a single cultural affinity indicator (e.g. Arabic, Hispanic, or Other) or three Boolean values, one for each

algorithm invoked.

culture under consideration, depending on the business decision made by CA/EX/CSD. If this option is chosen, linguistic processing information and scoring internal to ANC-E will not be available to outside processes.

- 3.1.1.4.2. The ANC-E will provide a determination as to which culture or cultures a name belongs.
- 3.1.1.4.3. The use that is made of the cultural affinity determinations made by ANC-E is a business decision of CA/EX/CSD (i.e. whether to allow a name to be processed by more than one namecheck algorithm, and whether ANC-E shall return more than one possible cultural affinity for a given input name). This decision will affect the design of the interface between the ANC-E and the rest of the CLASS-E system.

#### 3.1.1.5. Subordinates

The following processes are subordinate to the main ANC-E program:

- The Linguistically Informed Decision Processor (LID)
- The Digraph Distribution Processor
- The Final Decision Processor.
- 3.1.2. Linguistically Informed Decision (LID) Module Decomposition

#### 3.1.2.1. Identification

This module is referred to as the Linguistically Informed Decision Processor (LID).

#### 3.1.2.2. Type

The LID is a module which contains two subordinate modules. The first subordinate module performs linguistic analysis, gathering linguistic information and scoring for the input name. The second subordinate module makes decisions as to the cultural affinity of the name, based on the scoring information gathered by the first module.

## 3.1.2.3. Purpose

- 3.1.2.3.1. The LID exists to provide a linguistically well-founded decision as to the cultural affinity of the input name.
- 3.1.2.3.2. As the first phase of processing, the LID addresses performance requirements by basing this decision on multiple readily observable linguistic factors, thus obviating the need for processing by the more intensive statistical digraph model and for reliance on name-external factors, such as Country of Birth (COB).
- 3.1.2.3.3. Furthermore, the LID provides a more linguistically-rich context in which to determine the cultural affinity of the input name than does it's purely digraph-distribution-based predecessor, ANI. Thus ANC-E is better able to identify names that are Hispanic or Arabic and to eliminate those that are not. Linguistic Indicators provide a rich source of information about the cultural affinity of a name. The LID processor will serve as a means of assuring that names which are strongly Arabic or Hispanic are qualified and, conversely, that names which have strong characteristics of some other culture are disqualified. Names which qualify as Hispanic, Arabic or 'Other' will not be submitted to the Digraph Analysis function.

## 3.1.2.4. Function

- 3.1.2.4.1. All linguistic indicator processing will take place before digraph analysis and will constitute a linguistically informed decision (LID) mechanism.
- 3.1.2.4.2. The LID accumulates and weighs factors from multiple knowledge sources in order to determine whether there is a sufficient amount of evidence to identify the input name as being Hispanic or Arabic, or, conversely, if there is enough

evidence to discount the possibility that the input name is either Hispanic or Arabic.

- 3.1.2.4.3. The LID will assign points to a name based on a weighted tabulation of scores from the following data sources:
  - High Frequency name data
  - TAQ data
  - · Morphological data
  - Ngram data
- 3.1.2.4.4. The function of the LID is to determine a score for each cultural affinity being classified, and a score for 'Other'. For each culture, a name must get a score which passes its corresponding LID Threshold in order to be labeled as Arabic, Hispanic or "Other".
- 3.1.2.4.5. Each of the four types of linguistic indicator (listed in 3.1.2.4.3) will be associated with a set of four parameters, indicating the weight that a LID element is to be given.
- 3.1.2.4.6. The score for each language group will be calculated as a summation of the combination of the applicable factor times the score for each indicator found in the name string. Scoring details are included in the decomposition descriptions of the respective modules. (See sections 3.1.3 3.1.8.)
- 3.1.2.4.7. After all of the agents have processed the input name, the LID combines the detailed scoring information returned by the LIA to produce a LID score for Hispanic, Arabic, and for Other.
- 3.1.2.4.8. The LID passes the LID score to the Intermediate Decision Processor 1 for comparison to LID thresholds for cultures under consideration.
- 3.1.2.4.9. There are two alternatives for the output of the processing of the input name performed by the LID: an object containing linguistic processing information and scores or three Boolean values indicating whether the name has passed the LID

10.7

thresholds for Arabic, Hispanic, or Other. For more information, see 3.1.1.4.1.1.

- 3.1.2.4.10. If the LID identifies a name as Hispanic, Arabic, or Other (or any combination thereof), no further processing is required.
- 3.1.2.4.11. For a detailed example of LID processing, see the figures in Appendix A.

## 3.1.2.5. Subordinates

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The following processes are subordinate to the LID:

- The Linguistic Information Aggregator (LIA)
- Intermediate Decision Processor 1 (LID Decision).
- 3.1.3. Linguistic Information Aggregator (LIA) Module Decomposition
  - 3.1.3.1. Identification

This module is referred to as the Linguistic Information Aggregator (LIA).

3.1.3.2. Type

LIA is a module which contains four subordinate functions (agents) all of which contribute to the final decision or decisions made by the LID as to the cultural affinity of the input name. Thus, conceptually, LIA and the LID can be viewed as parts of a blackboard (voting) system, an expert system, or as parts of a system with multiple intelligent agents.

#### 3.1.3.3. Purpose

- 3.1.3.3.1. The LIA exists to enable the linguistic decision made by the LID. The LIA controls the flow of information from the four linguistic agents subordinate to it.
- 3.1.3.3.2. If the implementation choices accompanying the object-oriented description of ANC-E are chosen (see 3.1.1.4.1.1.1), LIA could help performance by allowing certain linguistic processing to occur only once for each name check, rather than once for each algorithm invoked. (Note: In Legacy CLASS each algorithm is referred to as a separate 'pipe'.)

#### 3.1.3.4. Function

- 3.1.3.4.1. LIA accumulates linguistic information factors from multiple knowledge sources for each culture under consideration (i.e. currently Hispanic, Arabic, and Other).
- 3.1.3.4.2. In cases of conflict, the order of precedence for identifying items within an input name is TAQ particle, Morpheme, Ngram.
  - 3.1.3.4.2.1. If a string of letters is identified as a TAQ particle for a particular culture, a substring of that same string (including the entire string itself) cannot also be identified as a Morpheme or an Ngram for that same culture.
  - 3.1.3.4.2.2. If a string is identified as a Morpheme for a particular culture, the characters that make up that Morpheme cannot also be considered as part of an Ngram for that culture.
  - 3.1.3.4.2.3. HF Names from a given culture can contain Morphemes and / or Ngrams for that same culture; however, the precedence rules in sections 3.1.3.4.2.1 and 3.1.3.4.2.2 apply.
- 3.1.3.4.3. As the subordinate functions (agents) process the input name, detailed scoring information is collected by LIA, and weighted according to its information value as indicated in the LID Parameter data store.
- 3.1.3.4.4. After all of the agents have provided their input, the LIA returns this detailed scoring information to the LID.
- 3.1.3.4.5. For a detailed example of aggregation of information by LIA, see the figures in Appendix A.

## 3.1.3.5. Subordinates

The following processes are subordinate to the LIA:

- The High Frequency (HF) Name Processor
- The Title, Affix, Qualifier (TAQ) Processor
- The Morphological Processor
- The Ngram Processor.

## 3.1.4. High Frequency (HF) Name Processor Module Decomposition

## 3.1.4.1. Identification

This function is referred to as HF Name Processor.

#### 3.1.4.2. Type

The HF Name Processor is a function which is invoked by the Linguistic Information Aggregator (LIA).

#### 3.1.4.3. Purpose

Certain given names and surnames occur much more frequently in some cultures than in others. The name "Mohammed", for example occurs frequently in Arabic names. The surname "Rodriguez" lends support to the possibility that the name in question is Hispanic. The name "Nganga" in any position suggests that the name might not be either Arabic or Hispanic. The HF Name Processor exists to take advantage of the information available in high frequency names in the cultural identification of the name.

## 3.1.4.4. Function

- 3.1.4.4.1. For each name segment present in the input name, the HF Name Processor determines whether that name is present in the HF Name data store.
- 3.1.4.4.2. If the name is present in the HF name data store, the HF Name Processor retrieves and records the culture, name field (given name or surname), and score associated with that name from the data store.
- 3.1.4.4.3. Also recorded for each HF name found is whether it was found in position or out of position. For example, since "Rodriguez" is listed as a surname in the HF Names data store, if it is found in the GN field in the input name, it

is reported as a surname considered to be out of position.

3.1.4.4.4. The HF Name Processor tracks scoring information for each HF name found, and returns this detailed scoring information to LIA.

3.1.4.5. Subordinates None.

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- 3.1.5. Title, Affix, Qualifier (TAQ) Processor Module Decomposition
  - 3.1.5.1. Identification

    This function is referred to as the TAQ Processor.
  - 3.1.5.2. Type

    The TAQ Processor is a function which is invoked by the Linguistic Information Aggregator (LIA).
  - 3.1.5.3. Purpose

As noted in section 1.3.1, name fields have a syntactic structure which may be simple, compound, complex, or compound-complex. Name fields which are complex or compound-complex contain particles: titles, affixes, or qualifiers. These particles can be used to further narrow the range of possibilities for the cultural affinity of the input name. The TAQ Processor exists to make use of the information available in particles.

- 3.1.5.4. Function
  - 3.1.5.4.1. For each segment present in the input name, the TAQ Processor determines whether that segment is a particle present in the TAQ data store.
  - 3.1.5.4.2. If the segment is present in the TAQ data store, the TAQ Processor retrieves and records the culture, name field (given name or surname), and score associated with that TAQ particle from the data store.

- 3.1.5.4.3. Also recorded for each TAQ particle found is whether it was found in position or out of position. (See example in section 3.1.4.4.3.)
- 3.1.5.4.4. The TAQ Processor tracks scoring information for each HF TAQ particle found, and returns this detailed scoring information to LIA.
- 3.1.5.5. Subordinates None.
- 3.1.6. Morphological Processor Module Decomposition
  - 3.1.6.1. Identification

    This function is referred to as Morphological Processor.
  - 3.1.6.2. Type

    The Morphological Processor is a function which is invoked by the Linguistic Information Aggregator (LIA).
  - 3.1.6.3. Purpose

As noted and defined in section 1.3.1, morphological elements, such as -ovich, can play a large part in determining the cultural affinity of an input name. The Morphological Processor exists to take advantage of this information in the name classification process.

- 3.1.6.4. Function
  - 3.1.6.4.1. For each Morpheme present in the Morphology data store, the Morphological Processor determines whether that Morpheme is present in the input name.
    - 3.1.6.4.1.1. Note that the above processing differs from that in the HF Name Processor (3.1.4.4) and the TAQ Processor (3.1.5.4). Since the Morphology data store contains only bound Morphemes, that is Morphemes not surrounded by white space, it is not possible to locate them based on name segments, which are surrounded by white space.

      Rather, it is necessary to determine if any of the items listed in the

Morphology data store is a substring of any of the name segments present in the input name, within certain constraints. For more detailed information on identifying Morphemes in the input name, see sections 3.2.4 (Morphological Data Store Data Decomposition) and 3.1.6 (Morphological Processor Module Decomposition).

- 3.1.6.4.2. For each Morpheme found in the input name, the Morphological Processor retrieves and records the morpheme found, the culture, name field (given name or surname), and score associated with that Morpheme from the data store.
- 3.1.6.4.3. Also recorded for each Morpheme found is whether it was found in position or out of position. (See example in section 3.1.4.4.3.)
- 3.1.6.4.4. The Morphological Processor tracks scoring information for each Morpheme found, and returns this detailed scoring information to LIA.
- 3.1.6.5. Subordinates None.

3.1.7.3. Purpose

- 3.1.7. Ngram Processor Module Decomposition
  - 3.1.7.1. Identification

    This function is referred to as the Ngram Processor.
  - 3.1.7.2. Type
    - The Ngram Processor is a function which is invoked by the Linguistic Information Aggregator (LIA).
    - As described in section 1.3.1, Ngrams are strings of letters that occur with statistical significance in names with a given cultural affinity. The Ngram Processor exists to take advantage of this statistical phenomenon in the name typing process.

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## 3.1.7.4. Function

- 3.1.7.4.1. For each Ngram present in the Ngram data store, the Ngram Processor determines whether that Ngram is present in the input name.
  - 3.1.7.4.1.1. Note that the above processing is similar to that in the Morphological Processor. (See section 3.1.6.4, and especially section 3.1.6.4.1.1 for a detailed note.)
- 3.1.7.4.2. For each Ngram found in the input name, the Ngram Processor retrieves and records the Ngram found, the culture, name field (given name or surname), and score associated with that Ngram from the data store.
- 3.1.7.4.3. Also recorded for each Ngram found is whether it was found in position or out of position. (See example in section 3.1.4.4.3.)
- 3.1.7.4.4. The Ngram Processor tracks scoring information for each Ngram found, and returns this detailed scoring information to LIA.
- 3.1.7.5. Subordinates None.
- 3.1.8. Intermediate Decision Processor 1 (LID Decision) Module Decomposition
  - 3.1.8.1. Identification

    This module is referred to as Intermediate Decision Processor 1 (IDP1).
  - 3.1.8.2. Type IDP1 is a function which is invoked directly by the Linguistically Informed Decision Processor (LID).
  - 3.1.8.3. Purpose

    IDP1 is the decision-making function of the LID. It determines whether enough linguistic information has been gathered from the various intelligent agents by LIA to

confidently determine that the input name belongs to one of the cultures being identified (currently Arabic, Hispanic, and Other).

## 3.1.8.4. Function

- 3.1.8.4.1. IDP1 accepts as input one aggregate LID score for each culture being identified as well as an aggregate LID score for Other.
- 3.1.8.4.2. For each LID score, IDP1 compares that score to the LID threshold for the appropriate culture (or Other).
- 3.1.8.4.3. If the LID score is greater than or equal to the appropriate LID threshold, IDP1 returns a value of True for the culture in question. If the LID score is less than the LID threshold for the culture in question, IDP1 returns a value of False for the culture in question.
  - 3.1.8.4.3.1. A True value indicates to the LID that enough evidence has been accumulated by LIA to confidently identify the name as belonging to the culture in question.
  - 3.1.8.4.3.2. A False value indicates to the LID that not enough evidence has been accumulated by LIA to confidently identify the name as belonging to the culture in question.
  - 3.1.8.4.3.3. A value of True can be returned for more than one cultural affinity.
  - 3.1.8.4.3.4. A value of False may be returned for all cultural affinities.
- 3.1.8.4.4. Alternatively, IDP1 could return a value for each culture equal to the LID score minus the LID threshold for that culture.
  - 3.1.8.4.4.1. Given the alternative above, the LID would interpret negative scores as

False values and nonnegative scores as True values.

- 3.1.8.4.4.2. The utility of this alternative is that if an object-oriented implementation is chosen, the values calculated by IDP1 could be incorporated into the object mentioned in section 3.1.1.4.1.1.1, and would be available as part of the information that the name object "knows" about itself for use in later processing.
- 3.1.8.4.5. If a return value of True for any culture (or for "Other") is obtained from IDP1, no further processing is required.
- 3.1.8.5. Subordinates None.
- 3.1.9. Digraph Distribution Processor Module Decomposition
  - 3.1.9.1. Identification

This module is referred to as the Digraph Distribution Processor.

3.1.9.2. Type

The Digraph Distribution Processor is a module which has two subordinate functions.

3.1.9.3. Purpose

The Arabic Name Identification (ANI) subprogram currently in use in Legacy CLASS is based purely on a model of digraph distribution in Arabic names. Digraph distribution information has proved useful in determining the cultural affinity of names. Based on a statistical model generated from digraph distribution statistics and initial and final trigraph statistics, the Digraph Distribution Processor lends additional information to the attempt to identify the provenance of the input name.

- 3.1.9.4. Function
  - 3.1.9.4.1. The Digraph Distribution Processor takes as input the surname from the name input to

- ANC-E. This portion of ANC-E operates only on surname data.
- 3.1.9.4.2. The Digraph Distribution Processor is invoked only when the LID has not been successful in assigning any cultural affinity to the input name. (See sections 3.1.2.4.10 and 3.1.8.4.5.)
- 3.1.9.4.3. The Digraph Distribution Processor calculates scores based on digraph distribution statistics for each culture in order to determine whether there is a sufficient amount of evidence to identify the input name as being Hispanic or Arabic. Note that there is no Digraph Distribution Score computed for Other.
- 3.1.9.4.4. The Digraph Distribution Parameters data store contains a Digraph Skew Factor for each cultural affinity.
- 3.1.9.4.5. The Total Digraph Distribution Score for the input name is equal to the Raw Digraph Distribution Score returned by the DIA plus the value of the Digraph Skew Factor for the appropriate culture.
- 3.1.9.4.6. The Digraph Distribution Processor passes the Total Digraph Distribution score for each culture to the Intermediate Decision Processor 2 for comparison to Digraph thresholds for cultures under consideration.
- 3.1.9.4.7. There are two alternatives for the output of the processing of the input name performed by the Digraph Distribution Processor: an object containing a Digraph Distribution Score for each culture, or two Boolean values indicating whether the name has passed the Digraph thresholds for Arabic or Hispanic. For more information, see 3.1.1.4.1.1.
- 3.1.9.4.8. If the Digraph Distribution Processor identifies a name as Hispanic, Arabic, or both no further processing is required.

## 3.1.9.5. Subordinates

The following processes are subordinate to the Digraph Distribution Processor:

- The Digraph Information Aggregator (DIA)
- Intermediate Decision Processor 2 (Digraph Decision).

## 3.1.10. Digraph Information Aggregator (DIA) Module Decomposition

## 3.1.10.1. Identification

This module is referred to as the Digraph Information Aggregator (DIA).

## 3.1.10.2. Type

The DIA is a process invoked by the Digraph Distribution Processor. The DIA operates only on surname segments consisting solely of alphabetic characters.

#### 3.1.10.3. Purpose

The DIA gathers the information necessary for the Digraph Distribution Processor to determine whether there is sufficient information to identify the input name as Hispanic or Arabic.

#### 3.1.10.4. Function

- 3.1.10.4.1. For purposes of DIA processing, a surname segment is defined as any string of characters delimited by white space.
  - 3.1.10.4.1.1. Given a surname containing more than one part as input, the name is segmented (based on white space).

    Each part of multi-part surnames is processed separately, and the scores are combined in the manner described below.
- 3.1.10.4.2. DIA will calculate a score for each surname segment by totaling the scores for all digraphs within the surname segment.
  - 3.1.10.4.2.1. The set of digraphs for a surname consists of all possible substrings of

two contiguous characters in the surname.

- 3.1.10.4.2.2. Word-boundaries are considered characters, so the additional digraphs "word-boundary+first-letter" and "last-letter+word-boundary" are included in the set of digraphs for each name.
- 3.1.10.4.2.3. In general, a surname segment of length n contains (n+1) digraphs, ordered from leftmost to rightmost.
- 3.1.10.4.3. Each digraph in the surname segment is looked up in a table containing scores for all possible digraphs for all cultural affinities being scored. DIA maintains a cumulative total of all digraph scores assigned to a surname segment.
- 3.1.10.4.4. Likewise, scores are assigned for the initial and final trigraphs of each name segment.
- 3.1.10.4.5. The initial and final trigraph scores are added to the cumulative score for that segment. A score is thus calculated for each segment of the surname.
- 3.1.10.4.6. The Raw Digraph Distribution Score for the input name is equal to the sum of all individual surname segment scores thus calculated.
- 3.1.10.5. Subordinates
- 3.1.11. Intermediate Decision Processor 2 (Digraph Decision) Module Decomposition
  - 3.1.11.1. Identification

This module is referred to as Intermediate Decision Processor 2 (IDP2).

3.1.11.2. Type

IDP2 is a function'which is invoked directly by the Digraph Distribution Processor.

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## 3.1.11.3. Purpose

IDP2 is the decision-making function of the Digraph Distribution Processor. It determines whether enough digraph distribution information is present to confidently determine that the input name belongs to one of the cultures being identified (currently Arabic or Hispanic).

#### 3.1.11.4. Function

- 3.1.11.4.1. IDP2 accepts as input one Digraph Distribution Score for each culture being identified.
- 3.1.11.4.2. For each Digraph Distribution Score, IDP2 compares that score to the Digraph threshold for the appropriate culture.
- 3.1.11.4.3. If the Digraph Distribution Score is greater than or equal to the appropriate Digraph threshold, IDP2 returns a value of True for the culture in question. If the Digraph Distribution Score is less than the Digraph threshold for the culture in question, IDP2 returns a value of False for the culture in question.
  - 3.1.11.4.3.1.A True value indicates to the Digraph
    Distribution Processor that digraph
    distribution information is conclusive
    enough to confidently identify the name
    as belonging to the culture in question.
  - 3.1.11.4.3.2.A False value indicates to the Digraph Distribution Processor that digraph distribution information is not conclusive enough to confidently identify the name as belonging to the culture in question.
  - 3.1.11.4.3.3.A value of True can be returned for more than one cultural affinity.
  - 3.1.11.4.3.4.A value of False may be returned for all cultural affinities.
- 3.1.11,4.4. Alternatively, IDP2 could return a value for each culture equal to the Digraph Distribution

Score minus the Digraph threshold for that culture.

- 3.1.11.4.4.1. Given the alternative above, the
  Digraph Distribution Processor would
  interpret negative scores as False
  values and nonnegative scores as True
  values.
- 3.1.11.4.4.2. The utility of this alternative is that if an object-oriented implementation is chosen, the values calculated by IDP2 could be incorporated into the object mentioned in section 3.1.1.4.1.1.1, and would be available as part of the information that the name object "knows" about itself for use in later processing.
- 3.1.11.5. Subordinates None.
- 3.1.12. Final Decision Processor Module Decomposition
  - 3.1.12.1. Identification

This module is referred to as the Final Decision Processor.

3.1.12.2. Type

The Final Decision Processor is a module invoked directly by the ANC-E main program.

- 3.1.12.3. Purpose
  - 3.1.12.3.1. Although the LID and the Digraph Distribution Processor are each powerful methods for identifying the cultural affinity of names in themselves, some benefit can be gained from combining the judgments of these two modules when neither has been successful in reaching a conclusion within a reasonable level of certainty on its own.
  - 3.1.12.3.2. Additionally, within the CLASS-E system, information about the Country of Birth (COB)

will usually be available. Although this information is not generally sufficient to determine the cultural affinity of a name in itself, it could provide the additional evidence necessary to reach a conclusion when combined with the judgments of the LID and the Digraph Distribution Processor.

3.1.12.3.3. The final decision processor exists to take all of this information into account, in an effort to determine the cultural affinity of the input name by combining all available data when the individual data elements themselves are not strong enough indicators.

#### 3.1.12.4. Function

- 3.1.12.4.1. In the event that neither the LID nor the Digraph Distribution Processor is successful in determining a cultural affinity for the input name, the processing continues to the Final Decision Processor. (See sections 3.1.2.4.10, 3.1.8.4.5, and 3.1.9.4.8.)
- 3.1.12.4.2. If the options suggested in sections
  3.1.1.4.1.1.1, 3.1.8.4.4, and 3.1.11.4.4 are incorporated into the implementation, the final Decision Processor will have access to all of the information it needs to perform its task encapsulated in the name information object.

  Otherwise, the Final Decision Processor will take as input LID scores (for each cultural affinity and for Other) and digraph scores (for each cultural affinity) for the input name.
- 3.1.12.4.3. For each culture still under consideration, the final decision processor will determine if the Digraph Distribution score for that culture is within the range specified by the Under\_Di\_Threshold parameter<sup>1</sup>. Note that since there is no Digraph Distribution score calculated for the cultural affinity "Other",

For additional information regarding the range specified by the Under\_Di\_Threshold parameter, see section 3.2.9.4.2.5.

there is no Under\_Di\_Threshold parameter associated with Other, and this processing applies only to cultures included in the current name classifier (e.g. Arabic and Hispanic).

- 3.1.12.4.3.1. In the event that the Digraph
  Distribution score is in the range
  specified for the particular culture,
  processing continues to determine if
  there is enough additional evidence to
  identify the input name as belonging
  to that culture.
- 3.1.12.4.3.2. In the event that the Digraph
  Distribution score is not in the range
  specified for the particular culture,
  that cultural affinity is removed from
  further consideration for the input
  name.
- 3.1.12.4.4. For each culture still under consideration, the final decision processor will determine if the LID score for that culture is within the range specified by the Under\_LID\_Threshold parameter<sup>1</sup>.
  - 3.1.12.4.4.1. In the event that the LID score is in the range specified for the particular culture, the final decision processor will identify the input name as belonging to that culture.
  - 3.1.12.4.4.2. In the event that the LID score is not in the range specified for the particular culture, processing continues to determine if there is enough additional evidence to identify the input name as belonging to that culture.
- 3.1.12.4.5. For each culture still under consideration, the Final Decision Processor determines whether

<sup>&</sup>lt;sup>1</sup> For more information regarding the range specified by the Under\_LID\_Threshold parameter, see section 3.2.9.4:2.4.

the COB supplied with the input name is in the partition associated with the cultural affinity, as defined in the COB Proximity (COBPROX) Data Store.

- 3.1.12.4.5.1. In the event that the COB supplied with the input name is in the partition associated with the cultural affinity under consideration, the final decision processor will identify the input name as belonging to that culture.
- 3.1.12.4.5.2. In the event that the COB supplied with the query is not in the partition associated with the cultural affinity under consideration, that cultural affinity is removed from further consideration for the input name.
- 3.1.12.4.5.3. In the event that the COB supplied with the input name is Unknown (i.e. "XXX" in Legacy CLASS), the Final Decision Processor will identify the input name as belonging to the cultural affinity under consideration. Note that this is a conscious decision to err on the side of recall in the absence of adequate information (that is, to identify a name as belonging to a culture, perhaps erroneously, in an effort to avoid erroneously not identifying some input names as belonging to that culture). This is related to the other policy decisions to be made by CA, and may change based on those decisions.
- 3.1.12.4.6. A summarization of the processing performed by the final decision processor is contained in Figure 3-2.

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IF (Di\_Threshold - Digraph\_Distribution\_Score - Under\_Di\_Threshold >= 0) AND ((LID\_Threshold - LID\_Score - Under\_LID\_Threshold >= 0) OR (COB\_of\_input\_name is in partition OR COB\_of\_input\_name is Unknown))
THEN
Identify Input Name as belonging to the culture in question
END IF

Figure 3-2

3.1.12.5. Subordinates None.

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#### 3.2. Data Decomposition

The data tables which underlie the Linguistically Informed Decision processor are crucial to the success of the algorithm. As discussed in 3.1.2.4.3, the linguistic data to be used are: High Frequency names, TAQ elements, Morphological elements and Ngrams. The entries for each of these linguistic sources will be associated, minimally, with a name field, a cultural group and a score. Also associated with the LID are control parameters. The Data entities accessed by the LID, as well as by other ANC-E Modules are depicted in Figure 3-3. This section describes in detail the data stores used by ANC-E. For examples of the type of information to be included in the data stores, see the detailed example in Appendix A.

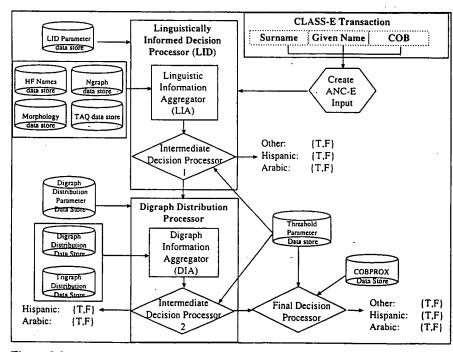


Figure 3-3

# 3.2.1. LID Parameter Data Store Data Decomposition

3.2.1.1. Identification

This data store is referred to as the LID Parameter Data Store.

3.2.1.2. Type

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The LID Parameter Data Store is a data store that is accessed by the LID module.

3.2.1.3. Purpose

- 3.2.1.3.1. The LID takes factors such as HF names, Ngrams, TAQ particles, and Morphemes into account in determining the cultural affinity of the input name.
- 3.2.1.3.2. Although each of these factors is valuable, they should not all be given the same relative weight in determining the cultural affinity score of the input name.
- 3.2.1.3.3. Furthermore, as in all real-world applications, the data in the CLASS-E database is not "clean". That is, data elements are not always found in the expected positions. Therefore, it is common to find surname elements in the given name field, and vice versa. Since it is not always possible to determine whether a particular instance of "out-of-field" data is due to random factors influencing data entry procedures or to a name's being from a culture other than the one hypothesized, data found "out of position" should not be given as great a weight as data found in the canonical position.
- 3.2.1.3.4. The LID Parameter data store exists in order to allow for different weighting of evidence found by the LID based on the above factors without hard-coding the exact weighting scheme itself in the LID. This will allow for runtime finetuning and adjustments to ANC-E without the necessity of recompiling LID module code.

#### 3.2.1.4. Function

3.2.1.4.1. Table 3.2-1 contains a description of the data to be contained in the LID Parameter data store.

DATA NAME	DATA TYPE	DATA	POSSIBLE
DATAMME		WIDTH	VALUES
AGENT_NAME	character	10	(HFNAME,
AGENT_NAME	<b>4.1.4.</b>		TAQ,
.*			MORPHOLOGY,
			NGRAM}
NAMEFIELD	character	1	{G,S}
INFIELD_SCORE	integer	2	{1,2,, 10}
OUT OF FIELD_SCORE	integer	2	$\{1, 2,, 10\}$

**Table 3.2-1** 

- 3.2.1.4.2. The LID uses the information provided in this data store when calculating aggregate cultural affinity scores from the detailed scoring information returned by LIA.
  - 3.2.1.4.2.1. AGENT\_NAME indicates to which agent (function) the given INFIELD\_SCORE and OUT\_OF\_FIELD\_SCORE weightings apply.
  - 3.2.1.4.2.2. NAMEFIELD indicates whether the INFIELD\_SCORE and OUT\_OF\_FIELD\_SCORE weightings apply to the Given Name (G) or to the Surname (S).
  - 3.2.1.4.2.3. IN\_FIELD\_SCORE is the weighting to be applied to data elements' raw scores returned by the specified agent when found in the specified name field.
  - 3.2.1.4.2.4. OUT\_OF\_FIELD\_SCORE is the weighting to be applied to data elements' raw scores returned by the specified agent when found out of the specified name field.

- 3.2.1.4.2.4.1. For more information concerning IN\_FIELD and OUT\_OF\_FIELD attributes returned from individual agents via LIA, see 3.1.4.4.3.
- 3.2.1.4.2.4.2. For an example of scoring of an input name using raw scores returned by agents and the LID Parameters, see Figure 3-4.
- 3.2.1.5. Subordinates None.
- 3.2.2. High Frequency Name Data Store Data Decomposition
  - 3.2.2.1. Identification

This data store is referred to as the HF Name Data Store.

3.2.2.2. Type

The HF Name Data Store is a data store that is accessed by the HF Name Processor.

3.2.2.3. Purpose

The HF Name Data Store encodes the knowledge necessary for the HF Name Processor function of the LID to add information needed for the cultural identification of the input name.

3.2.2.4. Function

3.2.2.4.1. Table 3.2-2 contains a description of the data to be contained in the HF Name data store.

DATA TYPE	DATA WIDTH	POSSIBLE VALUES	
character	24	*	
character	1	{G,S }	
integer	1	{1,2,3,4,5}	
character	1	{H, A, O}	
	character character integer	· WIDTH  character 24  character 1  integer 1	

**Table 3.2-2** 

- 3.2.2.4.2. The HF Name Processor uses the information provided in this data store when gathering detailed HF name cultural affinity information to be returned to LIA. High frequency given names and surnames for each of the three target cultural groups will be listed in the high frequency data store.
  - 3.2.2.4.2.1. NAME indicates the literal string representation of the HF name.
  - 3.2.2.4.2.2. NAMEFIELD indicates whether the score listed for the HF name applies to the Given Name (G) or to the Surname (S).
  - 3.2.2.4.2.3. SCORE reflects the degree to which a name may be considered high frequency within the culture in question, and is the score assigned by the HF Name Processor when the HF name listed is found in the input name. For processing details, see section 3.1.4, High Frequency (HF) Name Processor Module Decomposition.
  - 3.2.2.4.2.4. CULTURE indicates the cultural affinity with which the given NAME-NAMEFIELD-SCORE combination is associated.
  - 3.2.2.4.2.5. A HF name string may appear in the HF Names Data Store multiple times if it is associated with multiple cultural affinities, or if it associated with a different frequency score in the given name and surname. In this instance, the correct score must be assigned for each CULTURE, NAMEFILED combination associated with the HF name in question.
    - 3.2.2.4.2.5.1. For an example of scoring of an input name using raw scores returned by agents and

# 3.2.2.5. Subordinates

None.

## 3.2.3. TAQ Data Store Data Decomposition

#### 3.2.3.1. Identification

This data store is referred to as the TAQ Data Store.

## 3.2.3.2. Type

The TAQ Data Store is a data store that is accessed by the TAQ Processor.

#### 3.2.3.3. Purpose

The TAQ Data Store encodes the knowledge necessary for the TAQ Processor function of the LID to add information needed for the cultural identification of the input name.

#### 3.2.3.4. Function

3.2.3.4.1. Table 3.2-3 contains a description of the data to be contained in the TAQ data store.

DATA NAME	DATA TYPE	DATA	POSSIBLE
	•	WIDTH	VALUES
TAQ	character	24	*
NAMEFIELD	character	1	{G,S,B}
SCORE	integer	10	{1,2,3,4,5}
CULTURE	integer	3	11,000

Table 3.2-3

ANC-E

3.2.3.4.2. The TAQ Processor uses the information provided in this data store when gathering detailed TAQ - cultural affinity information to be returned to LIA. TAQ values for each of the three target cultural groups will be listed in the TAQ data store.

> 3.2.3.4.2.1., TAQ indicates the literal string representation of the Title, Affix or Qualifier particle. Note that only free

Morphemes are included in the TAQ data store, so, by definition, all TAQs are implicitly bounded by white space.

- 3.2.3.4.2.2. NAMEFIELD indicates whether the score listed for the given TAQ particle applies to the Given Name (G), to the Surname (S), or to Both (B).
  - 3.2.3.4.2.2.1. In the event that the NAMEFIELD is listed as "B", the associated TAQ is defined as "in position" whether it is found in the given name or in the surname field in the input name, and is scored accordingly.
- 3.2.3.4.2.3. SCORE is a score for the given TAQ-NAMEFIELD-CULTURE combination. The TAQ scores will reflect the predictive value of the TAQ particle for the culture with which it is associated. This is the score assigned by the TAQ Processor when the TAQ particle listed is found in the input name. For processing details, see section 3.1.5, Title, Affix, Qualifier (TAQ) Processor Module Decomposition.
- 3.2.3.4.2.4. CULTURE indicates the cultural affinity with which the given TAQ-NAMEFIELD-SCORE combination is associated.
- 3.2.3.4.2.5. A TAQ particle may appear in the TAQ Data Store multiple times if it is associated with multiple cultural affinities. In this instance, the correct score must be assigned for each cultural affinity associated with the TAQ value in question.
  - 3.2.3.4.2.5.1. For an example of scoring of an input name using raw

scores returned by agents and the LID Parameters, see Figure 3-4.

#### 3.2.3.5. Subordinates

None.

3.2.4. Morphological Data Store Data Decomposition

#### 3.2.4.1. Identification

This data store is referred to as the Morphological Data Store.

## 3.2.4.2. Type

The Morphological Data Store is a data store that is accessed by the Morphological Processor.

#### 3.2.4.3. Purpose

The Morphological Data Store encodes the knowledge necessary for the Morphological Processor function of the LID to intelligently process the input name, evaluating evidence based on culturally-specific Morphemes, and adding this to information needed for the cultural identification of the input name.

#### 3.2.4.4. Function

3.2.4.4.1. Table 3.2-4 contains a description of the data to be contained in the Morphology data store.

DATA NAME	DATA TYPE	DATA WIDTH	POSSIBLE VALUES
) (ODDITE) (E	-1	24	*
MORPHEME	character	. 24	
NAMEFIELD	character	1	{G, S, B}
MORHTYPE	character	1	{E, P, S, I, A}
SCORE	integer	1	{1, 2, 3, 4, 5}
CULTURE	character	1	{A, H, O}

Table 3.2-4

3.2.4.4.2. The Morphological Processor uses the information provided in this data store when gathering detailed Morpheme - cultural affinity

information to be returned to LIA. Morpheme values for each of the three target cultural groups will be listed in the Morphological Data Store.

- 3.2.4.4.2.1. MORPHEME indicates the literal string representation of the Morpheme. Note that only bound Morphemes are included in the Morphological data store, so, by definition, all Morphemes are intended to be located as substrings of individual segments of the input name.
- 3.2.4.4.2.2. NAMEFIELD indicates whether the score listed for the given Morpheme applies to the Given Name (G), to the Surname (S), or to Both (B).
  - 3.2.4.4.2.2.1. In the event that the NAMEFIELD is listed as "B", the associated MORPHEME is defined as "in position" whether it is found in the given name or in the surname field in the input name, and is scored accordingly.
- 3.2.4.4.2.3. MORPHTYPE indicates the linguistic distribution of the MORPHEME.
  - 3.2.4.4.2.3.1. Prefixes (P) are substrings which begin in the first character position of a name segment.
  - 3.2.4.4.2.3.2. INFIXES (I) are substrings which begin in a character position in the name segment which is not the first, and end in a character position in the name segment that is not the last. They are substrings that are neither at the beginning nor the end of the name segment.

- 3.2.4.4.2.3.3. SUFFIXES (S) are substrings which end in the final character position of a name segment.
- 3.2.4.4.2.3.4. A MORPHEME for which the MORPHTYPE is indicated as EDGE (E) can be found as either a PREFIX or a SUFFIX in a name segment in the input name.
- 3.2.4.4.2.3.5. A MORPHEME for which the MORPHTYPE is indicated as ALL (A) can be found anywhere in a name segment in the input name.
- 3.2.4.4.2.3.6. MORPHEMEs that are found in positions other than those indicated by the corresponding MORPHTYPE are not assigned any points for the purpose of identifying the cultural affinity of the input name.
- 3.2.4.4.2.4. SCORE is a score for the given MORPHEME-NAMEFIELD-MORPHTYPE-CULTURE combination. The MORPHEME scores will reflect the predictive value of the Morpheme for the culture with which it is associated. This is the score assigned by the Morphological Processor when the Morpheme listed is found in the input name. For processing details, see section 3.1.6, Morphological Processor Module Decomposition.
- 3.2.4.4.2.5. CULTURE indicates the cultural affinity with which the given MORPHEME-MORPHTYPE-

NAMEFIELD-SCORE combination is associated.

3.2.4.4.2.6. A Morpheme may appear in the Morphological Data Store multiple times if it is associated with multiple cultural affinities, or if it can be associated with multiple values of NAMEFIELD and/or MORPHTYPE for a given cultural affinity. In this instance, the correct score must be assigned for each MORPHEME-MORPHTYPE-NAMEFIELD-CULTURE combination associated with the Morpheme in question.

3.2.4.4.2.6.1. For an example of scoring of an input name using raw scores returned by agents and the LID Parameters, see Figure 3-4.

3.2.4.5. Subordinates None.

- 3.2.5. Ngram Data Store Data Decomposition
  - 3.2.5.1. Identification

    This data store is referred to as the Ngram Data Store.
  - 3.2.5.2. Type

    The Ngram Data Store is a data store that is accessed by the
    - Ngram Processor.
      - The Ngram Data Store encodes the knowledge necessary for the Ngram Processor function of the LID to add evidence based on the distribution of culturally salient Ngrams to information needed for the cultural identification of the input name.
  - 3.2.5.4. Function

3.2.5.3. Purpose

3.2.5.4.1. Table 3,2-5 contains a description of the data to be contained in the Ngram data store.

DATA NAME	DATA TYPE	DATA WIDTH	POSSIBLE
			VALUES
NGRAM	character	10	*
NAMEFIELD	character		{G, S, B}
NGRAMTYPE	character	1	{E, P, I, S, A}
SCORE	integer	1 .	{1, 2, 3, 4, 5}
CULTURE	character	1	{A, H, O}

Table 3.2-5

- 3.2.5.4.2. The Ngram Processor uses the information provided in this data store when gathering detailed cultural affinity information to be returned to LIA. Ngram values for each of the three target cultural groups will be listed in the Ngram Data Store.
  - 3.2.5.4.2.1. NGRAM indicates the literal string representation of the Ngram. Note that all Ngrams are intended to be located as substrings of individual segments of the input name.
  - 3.2.5.4.2.2. NAMEFIELD indicates whether the score listed for the given Ngram applies to the Given Name (G), to the Surname (S), or to Both (B).
    - 3.2.5.4.2.2.1. In the event that the NAMEFIELD is listed as "B", the associated NGRAM is defined as "in position" whether it is found in the given name or in the surname field in the input name, and is scored accordingly.
  - 3.2.5.4.2.3. NGRAMTYPE indicates the linguistic distribution of the NGRAM.
    - 3.2.5.4.2.3.1. PREFIXES (P) are substrings which begin in the first character position of a name segment.

- 3.2.5.4.2.3.2. INFIXES (I) are substrings which begin in a character position in the name segment which is not the first, and end in a character position in the name segment that is not the last. They are substrings that are neither at the beginning nor the end of the name segment.
- 3.2.5.4.2.3.3. SUFFIXES (S) are substrings which end in the final character position of a name segment.
- 3.2.5.4.2.3.4. An NGRAM for which the NGRAMTYPE is indicated as EDGE (E) can be found as either a PREFIX or a SUFFIX in a name segment in the input name.
- 3.2.5.4.2.3.5. An NGRAM for which the NGRAMTYPE is indicated as ALL (A) can be found anywhere in a name segment in the input name.
- 3.2.5.4.2.3.6. NGRAMs that are found in positions other than those indicated by the corresponding NGRAMTYPE are not assigned any points for the purpose of identifying the cultural affinity of the input name.
- 3.2.5.4.2.4. SCORE is a score for the given NGRAM-NAMEFIELD-NGRAMTYPE-CULTURE combination. The NGRAM scores will reflect the predictive value of the Ngram for the culture with which it is

associated. This is the score assigned by the Ngram Processor when the given Ngram is found in the input name. For processing details, see section 3.1.7, Ngram Processor Module Decomposition.

- 3.2.5.4.2.5. CULTURE indicates the cultural affinity with which the given NGRAM-NGRAMTYPE-NAMEFIELD-SCORE combination is associated.
- 3.2.5.4.2.6. An Ngram may appear in the Ngram
  Data Store multiple times if it is
  associated with multiple cultural
  affinities, or if it can be associated with
  multiple values of NAMEFIELD
  and/or NGRAMTYPE for a given
  cultural affinity. In this instance, the
  correct score must be assigned for each
  NGRAM-NGRAMTYPENAMEFIELD-CULTURE
  combination associated with the
  Ngram in question.
  - 3.2.5.4.2.6.1. For an example of scoring of an input name using raw scores returned by agents and the LID Parameters, see Figure 3-4.

3.2.5.5. Subordinates None.

Factors:	In Fie OutFi			,	In Fie OutFie		Ċ	Out! In I	ieldSN: : FieldSN: FieldGN: FieldGN:	3 4	Ċ	out! In F	eldSN: 3 FieldSN: 1 FieldGN: FieldGN:	2 2		Ou In	FieldSN: 5 FieldSN: FieldGN: tFieldGN:	3 4
In the second		cN]	u.	ah F	requency	GN	_		Prefixes	$\neg$		_	N-Grams	_			orphology	/
	requency			G		3	H	S	de	$\Box$	Н	S	-ndez	3	Α	S	adin	Ŀ
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HS	Sambrano		H	G	Mario	111	Н	S	las .	4-1	_	<u> </u>		13	0	┢	etto	†
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لتلتا	Silvestri	+	نا	G	Adalberto		ō	В	lo	Ī	0	s	-agio	$\Box$	0	S	ini	_
1 1 1	""Control	٠١	_											ort act	ual te	hle	values.	

N.B.:The data shown here are for the purpose of illustration only and do not necessarily reflect actual table values

Sample name: DELGADILLO DE GARCIA, JOSE ANTONIO

Jose Garcia Antonio -illo (10\*3) += 62(8 \* 3)(5\*1) +Hispanic (3\*1) +\*note that none of these elements are marked as Arabic in the sample data above.= 0 Arabic = 25(3\*3) +(8 \* 2)Other

N.B. The data shown here are for the purposes of illustration only and are not intended to make any statement about actual table values or parameter settings.

Figure 3-4

# 3.2.6. Digraph Distribution Data Store Data Decomposition

## 3.2.6.1. Identification

This data store is referred to as the Digraph Data Store.

#### 3.2.6.2. Type

The Digraph Data Store is a data store that is accessed by the Digraph Distribution Processor.

# 3.2.6.3. Purpose

The Digraph Data Store encodes the knowledge necessary regarding the statistical distribution of digraphs within a given culture. It is this information that drives the Digraph Distribution Processor.

# 3.2.6.4. Function

3.2.6.4.1. Table 3.2-6 contains a description of the data to be contained in the Digraph data store.

DATA NAME	DATA TYPE	DATA WIDTH	POSSIBLE VALUES
DI	character	2	*
SCORE	long	3.4	{-50.0000 - +50.0000}
CULTURE	character	1	{A, H}

**Table 3.2-6** 

- 3.2.6.4.2. The Digraph Processor uses the information provided in this data store when determining the contribution that the distribution of digraphs in the input name will have in determining the cultural affinity of that name Digraph Distribution statistics will be listed in the Digraph Data Store for each of the specific cultures being identified. That is, in the current implementation, Digraph Distribution statistics will be listed for Arabic and Hispanic; but not for "Other".
  - 3.2.6.4.2.1.1. DI indicates the literal string representation of the digraph. Note that digraphs may include all alphabetical characters as well as the word-boundary character "#".
  - 3.2.6.4.2.2. SCORE reflects the predictive value of the digraph for the culture with which it is associated. This is the score used by the Digraph Distribution Processor when the given digraph is found in the input name. For processing details, see section 3.1.9, Digraph Distribution Processor Module Decomposition.
  - 3.2.6.4.2.3. CULTURE indicates the cultural affinity with which the given DI-SCORE combination is associated.

3.2.6.5. Subordinates None.

#### 3.2.7. Trigraph Distribution Data Store Data Decomposition

#### 3.2.7.1. Identification

This data store is referred to as the Trigraph Data Store.

#### 3.2.7.2. Type

The Trigraph Data Store is a data store that is accessed by the Digraph Distribution Processor. The Digraph Distribution Processor takes initial and final trigraphs into account in producing a digraph distribution score for the input name.

#### 3.2.7.3. Purpose

The Trigraph Data Store encodes the knowledge necessary regarding the statistical distribution of trigraphs within a given culture. This information is taken into account in the Digraph Distribution Processor, since name boundaries tend to be highly indicative of the cultural affinity of the name.

#### 3.2.7.4. Function

3.2.7.4.1. Table 3.2-7 contains a description of the data to be contained in the Trigraph data store.

DATA NAME	DATA TYPE	DATA WIDTH	POSSIBLE VALUES
TRI	character	3	*
SCORE	long	3.4	{-50.0000 -
	, and the second		+50.0000}
CULTURE	character	1	{A, H}

Table 3.2-7

3.2.7.4.2. The Digraph Processor uses the information provided in this data store when determining the contribution that the distribution of initial and final trigraphs in the input name will have in determining the cultural affinity of that name Trigraph Distribution statistics will be listed in the Trigraph Data Store for each of the specific cultures being identified. That is, in the current implementation, Trigraph Distribution statistics will be listed for Arabic and Hispanic, but not for "Other".

- 3.2.7.4.2.1. DI indicates the literal string representation of the trigraph. Note that trigraphs may include all alphabetical characters as well as the word-boundary character "#".
- 3.2.7.4.2.2. SCORE reflects the predictive value of the trigraph for the culture with which it is associated. This is the score used by the Digraph Distribution Processor when the given trigraph is found in the input name. For processing details, see section 3.1.9, Digraph Distribution Processor Module Decomposition.
- 3.2.7.4.2.3. CULTURE indicates the cultural affinity with which the given DI-SCORE combination is associated.
- 3.2.7.4.3. Trigraph Distribution statistics for only initial and final trigraphs will be included in the Trigraph Data Store.
- 3.2.7.5. Subordinates

None.

- 3.2.8. Digraph Distribution Processor Parameter Data Store Data Decomposition
  - 3.2.8.1. Identification

This data store is referred to as the Digraph Processor Parameter Data Store.

3.2.8.2. Type

The Digraph Processor Parameter Data Store is a data store that is accessed by the Digraph Distribution Processor.

3.2.8.3. Purpose

The Digraph Processor Parameter Data Store contains adjustments that must be made to the digraph distribution scores computed by the Digraph Distribution Processor due to the fact that some cultures are over-represented in the digraph model.

#### 3.2.8.4. Function

3.2.8.4.1. Table 3.2-8 contains a description of the data to be contained in the Trigraph data store.

DATA NAME	DATA TYPE	DATA WIDTH	POSSÍBLE VALUES
SKEW	integer	3	(-999 - +999)
CULTURE	character	1	{A, H}

**Table 3.2-8** 

- 3.2.8.4.2. The Digraph Processor uses the information provided in this data store when determining the final digraph distribution score to assign to the input name. A SKEW will be specified in the Digraph Processor Parameter Data Store for each of the specific cultures being identified. That is, in the current implementation, a SKEW will be listed for Arabic and Hispanic, but not for "Other".
  - 3.2.8.4.2.1. SKEW indicates the value to be added to or subtracted from the raw digraph distribution score by the digraph distribution processor to level data distribution differences.
  - 3.2.8.4.2.2. CULTURE indicates the cultural affinity with which the given SKEW is associated.
- 3.2.8.5. Subordinates None.
- 3.2.9. Threshold Parameter Data Store Data Decomposition
  - 3.2.9.1. Identification

This data store is referred to as the Threshold Parameter Data Store.

3.2.9.2. Type

The Threshold Parameter Data Store is a data store that is accessed by the Intermediate Decision Processor 1 (IDP1),

the Intermediate Decision Processor 2 (IDP2), and the Final Decision Processor.

#### 3.2.9.3. Purpose

The Threshold Parameter Data Store contains information regarding thresholds that must be met in order for the input name to be identified as belonging to a particular target culture.

#### 3.2.9.4. Function

3.2.9.4.1. Table 3.2-9 contains a description of the data to be contained in the Threshold Parameter data store.

•		•	•
DATA NAME	DATA TYPE	DATA WIDTH	POSSIBLE
			VALUES
CULTURE	character	1	{A, H, O}
LID_THRESHOLD	integer	3	{0 - 999}
DI_THRESHOLD	float	3.4	{-999.9999 -
<del>-</del>			+999.9999}
UNDER_LID_	integer	3	{0 - 999}
THRESHOLD			
UNDER_DI_	integer	3	{0 - 999}
THRESHOLD	•	•	

**Table 3.2-9** 

ege (%)

3.2.9.4.2. The three "decision processor" modules (IDP1, IDP2, and the Final Decision Processor) use the information provided in this data store when determining whether enough information has been accumulated to identify the input name as belonging to a particular culture.

LID\_THRESHOLD and

UNDER\_LID\_THRESHOLD data values will be specified in the Threshold Parameter Data Store for each of the cultures being identified, including "Other". DI\_THRESHOLD and UNDER\_DI\_THRESHOLD values will be specified for specific cultures only (i.e. Hispanic and Arabic).

- 3.2.9.4.2.1. CULTURE indicates the cultural affinity with which the given threshold is associated.
- 3.2.9.4.2.2. LID\_THRESHOLD is used by IDP1 in determining whether enough information has been accumulated to identify the input name as belonging to a particular culture. For processing information, see section 3.1.8, Intermediate Decision Processor 1 (LID Decision) Module Decomposition.
- 3.2.9.4.2.3. DI\_THRESHOLD is used in IDP2 in determining whether enough information has been accumulated to identify the input name as belonging to a particular culture. For processing information, see section 3.1.11, Intermediate Decision Processor 2 (Digraph Decision) Module Decomposition.
- 3.2.9.4.2.4. UNDER\_LID\_THRESHOLD is used by the Final Decision Processor, and indicates the amount by which a name can fall short of the LID\_THRESHOLD and still be considered for membership in a particular culture, provided that other criteria are met. As such, UNDER\_LID\_THRESHOLD defines a range of values (between the UNDER\_LID\_THRESHOLD and the LID\_THRESHOLD) that, when considered in conjunction with other evidence, can result in the input name's being identified as belonging to the culture in question. For processing information see section 3.1.12, Final Decision Processor Module Decomposition and Figure 3-, 2.

3.2.9.4.2.5. UNDER\_DI\_THRESHOLD is used by the Final Decision Processor, and indicates the amount by which a name can fall short of the DI\_THRESHOLD and still be considered for membership in a particular culture, provided that other criteria are met. As such, UNDER\_DI\_THRESHOLD defines a range of values (between the UNDER\_DI\_THRESHOLD and the DI\_THRESHOLD) that, when considered in conjunction with other evidence, can result in the input name's being identified as belonging to the culture in question. For processing information, see section 3.1.12, Final Decision Processor Module Decomposition and Figure 3-

# 3.2.9.5. Subordinates None.

#### 3.2.10. COB Proximity (COBPROX) Data Store Data Decomposition

#### 3.2.10.1. Identification

This data store is referred to as the COBPROX Data Store.

#### 3.2.10.2. Type

The COBPROX Data Store is a data store that is accessed by the Final Decision Processor.

## 3.2.10.3. Purpose

The COBPROX Data Store contains information enabling the Final Decision Processor to determine which COBs are to be considered as related when determining the cultural affinity of the input name. For processing information, see section 3.1.12.4.5 and Figure 3-2.

## 3.2.10.4. Function

3.2.10.4.1.1. ANC-E will use the CLASS-E COBPROX Data Store ("partition table") to fill this function.

3.2.10.5. Subordinates None.

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and bear

APPENDIX A: DETAILED EXAMPLE OF ANC-E LID PROCESSING

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# **LIA Data Stores**

	High Frequency						N	-Grams	
Н	i	Garcia	3		Н	s	S	ndez	3
Н	S	Salazar	2	]	Н	S	G	far	1
Н	s	Sambrano	I	]	Α	В	Р	bous	1
Α	В	Mahmoud	4		Α	В	s	fiq	2
Ā	В	Jaffar	2		0	S	E	agio	1
0	S	Silvestri	1	1	0	S	ī	ahmo	5

	Morphology							TAO	
A	В	s	addin	2		Н	s	de	1
Α	В	s	edin	3		Н	s	la	1
Α	В	s	uddin	3		Н	S	las	1
0	s	Р	etto	1		Α	В	bin	3
0	s	s	etti	2		0	В	cl	1
0	s	S	ini	1		0	В	lo	1

# Digraph Distribution Processor Data Stores

į	Digraphs		
	Α	ez	-1.0422
	A	nt	22.8733
	A	bd	38.7221
	Н	bd	1.0572
ļ	Н	ez	42.5947
Ì	Н	гi	16.1242

Trigraphs		
Α	ez#	-10.042
Α	#nt	-48.174
Α	bd#	48.4551
Н	bd#	-32.174
Н	ez#	47.5327
Н	#ri	11.1242
	A A H H	A ez# A #nt A bd# H bd# H ez#

Digraph Processo		
Α	44.2331	
Н	-32.8765	

LID Para	me	ers	
HFNAME	S	10	8
HFNAME	G	8	6
TAO	S	5	3
TAO	G	4	2
MORPHOLOGY		_5	3
MORPHOLOG	Ç	4	2
NGRAM	S	4	3
NGRAM	G	3	2

Threshold Parameters				
_50	1 4532	10	8	
_73	20.5000	5	. 6	
38	(null)	100	3	
	50 73	50 1.4532 73 20.5000	50 1.4532 10 73 20.5000 5	50 1.4532 10 8 73 20.5000 5 6

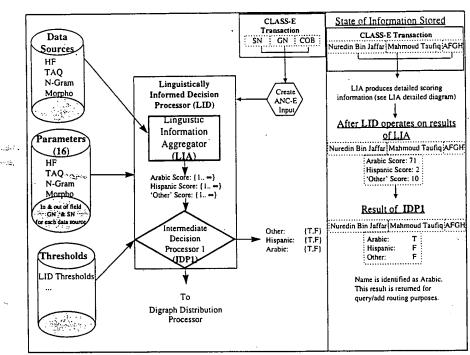
CORPROY
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(CLASS-E COB
Proximity Table
to be used for
ANC-E.)
1734

N.B.:The data shown here are for the purpose of illustration only and do not necessarily reflect actual values

Sample ANC-E Data Stores

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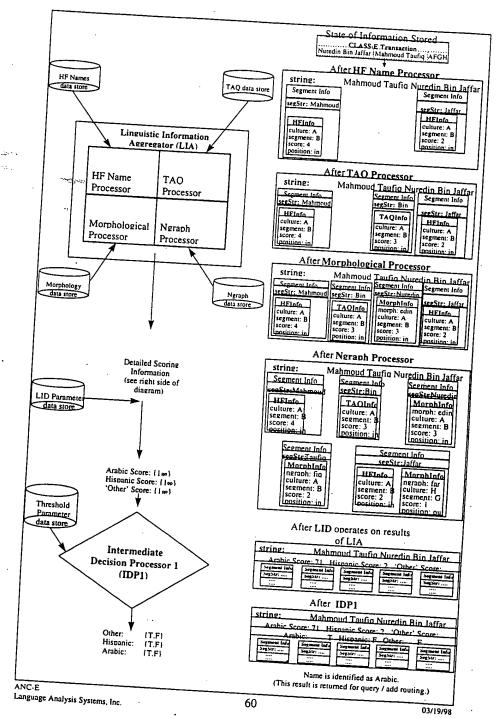
57



Overview of LID Processing

Detailed View of LID Processing (p. 60)

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# SOFTWARE DESIGN DESCRIPTION FOR THE ARABIC NAME SEARCH ALGORITHM FOR CLASS - E (ANA - E)

# TABLE OF CONTENTS

	]
1. INTRODUCTION	
2. MODULE DECOMPOSITION	5
DATA DECOMPOSITION	

# SOFTWARE DESIGN DESCRIPTION FOR THE ARABIC NAME SEARCH ALGORITHM FOR CLASS - E (ANA - E)

INTRODUCTION

#### 1.1. Purpose

The variation that can occur in the transcription of Arabic names into roman representation poses formidable problems for retrieval systems with very large databases that depend solely on standard string-comparison techniques. For example, the following names are transcription variants of the same name: SALEHUDDINE, IMHEMED and SAALAH EL DEEN, MUHAMMED. The significant differences in their spellings and in the distribution of white space would virtually preclude any possibility of identifying these names as similar enough to be candidates for retrieval if the usual techniques were applied. The task, then, is to capture the relatedness of these names and to incorporate the insights into their commonality into the retrieval system.

Arabic names are made up of a Given Name (GN) (usually one, although compound names may occur: SAMIR; MOHAMAD ALI) and a string of familial (paternal) relations following the GN (ABD EL KADEER SAMIR ABD EL LATIF). The string following the GN is generally made up of GNs which are taken from the father, grandfather and other relations. Only in rare cases can any of these segments be identified as a SN, i.e., a name used by every member of the family to signal family membership. The full string following the GN provides crucial information about the individual that is lost if it is sometimes in the GN field and sometimes in the SN field. So, positioning names that occur after the first GN in the SN field provides the opportunity for better matches.

### 1.2. Scope

In 1996, LAS proposed an initial solution to the problem, the salient feature of which was to level spelling differences and thereby generate one representation for the myriad spellings of a single name. This process is known as *regularization*, a technique that was implemented in the Legacy CLASS system as Legacy ANA. Legacy ANA is a preprocessing module that feeds into the Legacy CLASS search system. The general characteristics of Legacy ANA are:

1) Both query and add procedures are identical for the Legacy ANA system.

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- 2) A rudimentary Arabic name identifier (ANI) determines if an input name qualifies for handling by the Legacy ANA algorithm. All names that qualify for Legacy ANA handling are also sent to the generic processing module provided by Legacy CLASS and to the DOB processor, when appropriate.
- 3) A set of regularization rules is applied to the Arabic input name, leveling the spelling differences of the name segments to the most common representation of the input name. IMHEMED and MUHAMMED will both be regularized to the form MUHAMAD, for example. Some title/affix/qualifier information may also be removed from the name to focus on the name stem. The regularization rules are rewrite rules that use notation developed solely for this processor. The rule engine necessary for implementation of the regularization rules was also developed specifically to handle the Legacy ANA regularization rules. The output of the regularization component is a regularized form of the input name.
- 4) The output of the regularization component (the regularized form of the name) serves as the input to the generic CLASS search system. CLASS produces standard compressed-name keys, but on the regularized form that is the output of Legacy ANA. CLASS accesses the database records through the keys on the regularized form. (The keys are generated for both queries and adds and are stored with the record when a record is added to the database.)
- 5) A digraph match is then performed on the regularized record and query forms to determine name similarity. The match criteria are those of CLASS.

The ANA-E system is an enhancement of the Arabic name search system that was developed by LAS for the Legacy CLASS system. The principle of name regularization remains the same in ANA-E, although the design and approach of ANA-E are different in a number of important ways.

- An independent Name Classifier (ANC-E) has been developed. (The ANC-E design description is provided as Attachment A in LAS Linguistic Memo CT970044, May 30, 1997) ANC-E will direct input names to the Arabic and/or Hispanic processors. Its functionality is far more sophisticated than the Arabic name typer (ANI). All records will also be directed to the CN pipe of CLASS-E and to the DOB pipe, if appropriate.
- 2) A significant amount of preprocessing of the name takes place in ANA-E that recognizes the unique character of Arabic names, focusing on the leftmost GN as the most stable element in the name and rejoining all other GN segments with their SN partners.
- 3) The regularization rules and rule engine have changed. The rules are represented in standard regular expressions and the format has changed. The rule engine uses different match techniques, is much simpler in its implementation and therefore can be easily applied to other rule sets.
- 4) The output of the regularization rules is a computationally viable form, one that may not be the most common representation of a name (as was a requirement of Legacy ANA).

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- 5) The new ANA-E rule language has already allowed a dramatic increase in the amount of regularization that takes place. For those records that qualify as Arabic, a decrease of 13% in the number of different regularized forms from Legacy ANA (as of March 1997) to the proposed ANA-E regularization rules demonstrates the greater flexibility of the ANA-E language. The system must therefore accommodate fewer distinct name-segments, reducing processing time and increasing the scope of retrieval.
- 6) Arabic-specific keys have been generated to account for the nature of Arabic names and at the same time permit some unpredictable variation. The regularization rules account for much of the predictable variation in names but are only incidentally able to accommodate unpredictable variation (e.g., error).
- Retrieval is based on keys that represent a class of pre-determined variants of a name segment and are formed from the GN1 and SN segments.
- Gender has been added as a search criterion to reduce the occurrence of crossed-gender retrievals.
- 9) The filtering techniques used in ANA-E demonstrate much greater granularity and sensitivity to Arabic-specific name characteristics.

The CLASS-E system will support several concurrent record search processes. The Multi-Pipe Architecture (MPA) already in place supports the generic-CLASS search process and a distinct Date-of-Birth process. (Because the Legacy ANA system serves as a preprocessing module that feeds into the generic-CLASS processing pipe, Legacy ANA is not characterized as a separate search pipe.)

In CLASS-E the Multi-Pipe Architecture will be extended to include a distinct Arabic processing pipe, a distinct Hispanic processing pipe as well as perhaps others in the future. An input name may be submitted to more than one processing pipe. It is a business decision of CA/EX/CSD to determine to which and how many pipes to pass a given input name. It is suggested that names classified as Arabic by the Advanced Name Classifier for CLASS-E (ANC-E) be submitted to multiple processors: the generic CLASS-E processing pipe, the DOB processing pipe and the ANA-E processing pipe.

1.3. Definitions and Acronyms

1.3. Deni	Ittoris and Act ony
ACOB	Arabic COB Category Data Store
ADE	Arabic Data Evaluator
AFS	Arabic Filter and Sorter
AG	Applicant Gender (user supplied)
AGI	Arabic Gender Identifier
AKG	Arabic Key Generator
ANA - E	Arabic Name Search Algorithm for CLASS - E
ANC - E	Advanced Name Classifier for CLASS - E
	Arabic Name Identifier (Legacy ANA)
ANI	Arabic Name Regularizer
ANR	Arabic Name Type Data Store
ANT	Arabic Pre-Processor
APP	
ARE	Arabic Rule Engine

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ASE Arabic Search Engine ASP Arabic Segment Positioner ATD Arabic TAQ Data Store ATP Arabic TAQ Data Store COBPROX COB Proximity Data Store DELETE Segment will be removed from any further consideration in the name matching process; it will contribute marginally to the filtering process. The segment will not be removed from the record.  DISREGARD Segment will not be removed from the record.  Segment will be removed from consideration in the name retrieval process but will contribute to the filtering and sorting processes.  DI_VAL Digraph Value First Name Unknown FP Filter Parameter Data Store GN Given Name GNI Elefmost GNI segment GNDR Gender GNTHR Given Name Threshold (Filter) GN_VAL Final Given Name Value Given Name Field All name segments to the right of the comma HF High Frequency HFI Arabic High Frequency Name Identifier HK High Frequency Key HS High Frequency Search Key INITGN Given Name Initial Value NITSN Surname Initial Value NITSN Surname Initial Value NITSN Surname Initial Value LEF Low Frequency LTF Linguistic Trace Facility M Male Gender OPSN Out-of-Position Surname Segment OPVAL Out-of-Position Surname Segment OPVAL Out-of-Position Surname Segment OPVAL Out-of-Position Surname Segment RCL Refusal Code Level Data Store Record Gender Gender determined for a record based on two gender validators, input gender and HF name gender; all gender indicators must agree. Regularization Refusal Code Level Data Store Record Gender RCL Refusal Code Level Data Store Refusal Code Level Position name Position Surname Segment OPVAL Out-of-Position Surname Segment OPVAL Out-of-Positio		
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Segment Any single name piece, surrounded by white space		
Segment Any single name piece, surrounded by write space		Refusal Code Level/ rear-of-birth Range Data Store
		Any single name piece, surrounded by write space
	SI	
SK . Search Key		
SNTHR Surname Threshold (Filter)		
SN_VAL Final Surname Value		
SP Special Key		
SS Standard Search Key		
Surname Field All name segments to the left of the comma		
TF TAQ Filter Data Store	TF	TAQ Filter Data Store

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TAQ	Title/Affix/Qualifier
TAQAGN	Value for Missing TAQ in the Given Name
TAQASN	Value for Missing TAQ in the Surname
TAQXGN	Value for TAQ DELETE in Given Name
TAQXSN	Value for TAQ DELECT in Surname
U	Unknown (Ambiguous) Gender
WK	Wild-Card Key
YR	Year-of-Birth Range Data Store

# 2. MODULE DECOMPOSITION

475

- 2.1. The Arabic Name Search Algorithm for CLASS-E (ANA-E) will consist of three primary components (see pages 6-9 for graphic representations of these components):
  - the Arabic Pre-Processor (APP),
  - the Arabic Search Engine (ASE), and
  - the Arabic Filter and Sorter (AFS).

### 2.2. ARABIC PRE-PROCESSOR MODULE DECOMPOSITION

#### 2.2.1. Identification

This module is known as the Arabic Pre-Processor (APP).

#### 2.2.2. Type

The APP is the first programming module in the larger ANA-E algorithm and consists of subordinate functions that manipulate the name segments in various ways to prepare the name for creation of search keys by Arabic Search Engine.

#### -2.2.3. Purpose

Because of the significant variation that can occur in names that have been romanized from the original Arabic script, Arabic names will benefit from attempts to level the spelling differences. In addition, the standard format of an Arabic name is Given Name followed by a string of segments that indicate familial relations. In many countries, none of these segments functions as what is standardly referred to as a *surname*. What is determined to be a Surname for purposes of a CLASS retrieval (i.e., what is placed in the Surname field) is therefore quite arbitrary. Arabic names will consequently benefit from movement of name segments that would contribute to a potential match.

### 2.2.4. Function

- 2.2.4.1. The Arabic Pre-Processor (APP) will accept as input any name that has been identified as Arabic by the Advanced Name Classifier for CLASS-E (ANC-E) and will prepare a name for the Arabic Search Engine by applying Arabic regularization rules to the name segments and reorganizing the name according to Arabic naming principles.
- 2.2.4.2. The APP can alternatively create a name object that "knows" characteristics about itself and collects information as it proceeds through the processing functions.

### 2.2.5. Subordinates

- Arabic Name Regularizer (ANR)
- Arabic TAQ Processor (ATP)
- Arabic Data Evaluator (ADE)
- Arabic Segment Positioner (ASP)
- Arabic Gender Identifier (AGI)

### 2.3. ARABIC NAME REGULARIZER MODULE DECOMPOSITION

#### 2.3.1. Identification

This module will be known as the Arabic Name Regularizer (ANR) and will consist of one subordinate processor, the Arabic Rule Engine, which will access and apply the rules in one data store, the Arabic Regularization Rules (ARR) Data Store.

### 2.3.2. Type

The ANR is a program that

- will operate on a full surname string and a full given name string of an add or query record,
- will generate a regularized form for each name segment or string of name segments to which the regularization rules have applied, and
- will submit the regularized form to other functions in the APP to continue to prepare the name for submission to the Arabic Search Engine.

#### 2.3.3. Purpose

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The transcription of Arabic names from their native format (Arabic script) to the roman alphabet is highly variable; few, if any, transcription standards exist. Such rampant variation poses significant problems for string matching and retrieval systems; there are often too many characters that differ to effect a retrieval in character-based retrieval systems. For example, MUHAMMAD and IMHEMED are roman spellings of the same name; that is, they are represented by the same string of characters in the Arabic script. Leveling the differences in roman spelling, wherever possible, would improve record retrieval dramatically.

#### 2.3.4. Function

The ANR applies a set of regularization rules (ARR) to the surname and to the given name through the Arabic Rule Engine and produces a regularized form for any name segment or string of segments to which the rules can apply.

### 2.3.5. Subordinates

The ANR consists of one subordinate function, the Arabic Rule Engine, which accesses the Arabic Regularization Rule Data Store.

#### 2.4. ARABIC RULE ENGINE MODULE DECOMPOSITION

### 2.4.1. Identification

This function is known as the Arabic Rule Engine (ARE).

### 2.4.2. Type

The ARE is a program that attempts to apply transformation rules to an input string of characters and to effect a change in that string.

### 2.4.3. Purpose

- 2.4.3.1. The development of rules that are implemented in standard and readily accessible regular expressions allows for use of a less idiosyncratic rule engine than the one developed for Legacy ANA. (See Arabic Regularization Rule Data Store, Section 3.3).
- 2.4.3.2. The Arabic Regularization Rules (ARR) require an implementation module to effect the changes specified in the rules. The ARE plays that role.
- 2.4.3.3. The ARE replaces the rule engine developed for Legacy ANA. It is simpler and more generic and can be used for other rule implementations.
- 2.4.3.4. The ARR are more easily altered and reviewed.

#### 2.4.4. Function

- 2.4.4.1. The ARE accepts a full surname (SN) or full given name (GN) string as input.
- 2.4.4.2. The ARE will add a white space to the beginning of the SN or GN string that it accepts to serve as boundary markers.
- 2.4.4.3. The ARE scans the input string from left to right and attempts to match the Match Context of a rule.
- 2.4.4.4. If the ARE is able to identify a Match Context, it checks to see if the Pre- and Post-Contexts specified in the rule are present.
  - 2.4.4.4.1. If the Pre- and Post-Contexts specified in the rule match, then the ARE applies the rule and makes the specified change in the Match Context, producing the Output.
  - 2.4.4.4.2. The ARE then returns to the top of the rule set and attempts to identify a Match Context beginning with the character immediately following the previous Match Context.
- 2.4.4.5. If no match is found, the ARE moves to the Match Context of the next rule.
- 2.4.4.6. If no rule has fired, the default rule applies: the character output is the character itself. E.g.,  $S \rightarrow S$

### 2.4.4.7. Arabic Regularization Rules (ARR)

- 2.4.4.7.1. The ARRs are written as regular expressions and use, for the most part, regular expression notation. See Section 3.3 for ARR details.
- 2.4.4.7.2. The ARRs use defined metasymbols.
- 2.4.4.7.3. The ARE must be able to recognize all regular expression notation and metasymbols of the ARR and implement them.

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### 2.4.4.7.4. ARRs have the format:

Figure 1: Format: Arabic Regularization Rule

PRE-CONTEXT | MATCH CONTEXT | POST-CONTEXT | → OUTPUT

### 2.4.4.7.5. Rule Ordering

- 2.4.4.7.5.1. Rule ordering is important because the **first** rule for which the ARE finds a Match Context (and the Pre- and Post-Contexts match as well) will apply. Once the rule has applied to the Match Context, no other rules will apply to it: *No* following rule will then fire on that Match Context.
  - 2.4.4.7.5.1.1. The rules must have internal ordering based on the Match Context only.
  - 2.4.4.7.5.1.2. Rules may intrude in the ordering of the Match Context if they are applicable to another phenomenon.
    - 2.4.4.7.5.1.2.1. For example, an MI  $\rightarrow$  NE rule will need to precede an M  $\rightarrow$  N rule or the MI  $\rightarrow$  NE will never apply.
    - 2.4.4.7.5.1.2.2. A rule that applies to a Match Context where A → AW could intervene between the "M" rules and have no effect on the order of application of the "M" rules.
    - 2.4.4.7.5.1.2.3. In general, rules with longer character strings in the Match Context need to precede rules with shorter character strings.
    - 2.4.4.7.5.1.2.4. Care must be taken when rules have symbols for optional characters, for example. The ordering of an M?L rule (a rule that can apply to ML or L) must be carefully placed with respect to other rules that apply to M and L.
- 2.4.4.7.5.2. The Output of one rule does *not* form the input to another rule.

- 2.4.4.7.5.2.1. Only one rule applies to a character or character string that matches a Match Context.
- 2.4.4.7.5.2.2. The first rule that matches all three contexts in the Match, Pre- and Post- Context order is applied.
- 2.4.4.7.5.2.3. The Output of a rule cannot then be changed.
- 2.4.4.7.5.2.4. Rules must be written so that they stand alone: rules are not interdependent.
- 2.4.4.7.5.3. If the ARE is able to match the Match Context, the Pre- and Post-Contexts are examined.
  - 2.4.4.7.5.3.1. If the Pre- and Post-Contexts both match, the ARE effects the change in the Match Context indicated in the OUTPUT.
    - 2.4.4.7.5.3.1.1. The next available context in the input string to be considered for a match immediately follows the previous *Match Context*.
    - 2.4.4.7.5.3.1.2. For example, if HEIMER is the input string and a rule applies to HEIM to make it GIM, the next available context for consideration is the E of ER (following HEIM). If an E rule is to apply, it can only apply to the *second* E, not that of the previous Match Context (HEIM).
    - 2.4.4.7.5.3.1.3. The Output of a previous rule cannot be the Pre- or Post-Context of a following rule.
  - 2.4.4.7.5.3.2. The rule is applied only if the ARE is successful in matching the Match Context and the Pre- and Post-Contexts.
- 2.4.4.7.6. There is no backtracking in the ARE.
- 2.4.4.7.7. The output of successful application of rule(s) by the ARE is a regularized Arabic form. The output of the ARE can be in any string form (e.g., binary, regular expression, characters).
- 2.4.4.8. Subordinates

None.

### 2.5. ARABIC TAQ PROCESSOR MODULE DECOMPOSITION

### 2.5.1. Identification

This function is known as the Arabic TAQ Processor (ATP).

### 2.5.2. **Type**

The ATP is a function that identifies titles (T), affixes (A) and qualifiers (Q), as specified in the Arabic TAQ Data Store, and implements the disposition indicated in that table.

### 2.5.3. Purpose

Arabic names frequently contain peripheral name elements, such as ABDEL, ABU, AL. Matching on these segments is not generally useful; the name segments with information value are the name stems, RAHMAN, SAYED, HANAWI. Removal of or disregard for the peripheral name elements allows more emphasis to be placed on the name stems.

### 2.5.4. Function

- 2.5.4.1. The ATP will access the Arabic TAQ Data Store (ATD) to identify titles (e.g., USTAAZ), affixes (e.g., EL DIN) and qualifiers (Q) that occur in the regularized name.
- 2.5.4.2. The ATP will tag as a T, P, I, S, or Q any such segments found in the name, as specified in the ATD.
  - 2.5.4.2.1. The ATP will scan the full SN or GN field for any TAQ segments.
  - 2.5.4.2.2. If the ATP identifies a segment, it will tag the segment with the ID NO and disposition, as indicated in the ATD.
  - 2.5.4.2.3. If the following segment is also a TAQ segment, it will tag the segment with the ID\_NO and disposition, as indicated in the ATD.
  - 2.5.4.2.4. This will continue until all *consecutive* TAQ segments have been tagged.
  - 2.5.4.2.5. When the ATP encounters a following segment that is not a TAQ segment, it will treat that segment as a stem.
    - 2.5.4.2.5.1. Each TAQ segment identified up to that point will be given the TAQ\_TYPE P (prefix) and each will be associated and stored with the following stem.
  - 2.5.4.2.6. The ATP will move to the next segment following the stem and will repeat the TAQ identification process.
    - 2.5.4.2.6.1. The ATP will tag all TAQ segments with the ID\_NO and disposition.
    - 2.5.4.2.6.2. When the ATP encounters a stem, it will tag each TAQ segment (not yet associated with a stem) with the TAQ\_TYPE P and will associate and store each TAQ segment with the following stem.

- 2.5.4.2.7. If the ATP encounters a TAQ segment (or segments) that has no following stem, it will access the ATD to determine if the TAQ type is a Suffix (S).
  - 2.5.4.2.7.1. If the TAQ has a TAQ\_TYPE S, the TAQ will be associated and stored with the *preceding* stem.
  - 2.5.4.2.7.2. The preceding stem may already have prefixal TAQs.
  - 2.5.4.2.7.3. If the TAQ type is not equal to S, the TAQ will be tagged a Stranded Affix.
- 2.5.4.3. The ATP will process any TAQ segments identified according to the treatment indicated in the ATD. (See Section 3.4.)
  - 2.5.4.3.1. Treatment options include DELETE and DISREGARD.
  - 2.5.4.3.2. **DELETE** means that the segment is completely disregarded in the remainder of the name search process and contributes marginal information to the filtering process. (N.B. The segment is not deleted from the record.)
  - 2.5.4.3.3. **DISREGARD** means that the segment is disregarded in the remainder of the name search process but contributes to the evaluation of the name in the filtering processes.

### 2.5.4.4. TAQ Tag

- 2.5.4.4.1. The TAQ tag will reference the ID\_NO of the TAQ.
- 2.5.4.4.2. The TAQ tag will reference the indicated treatment of the TAQ segment.
- 2.5.4.4.3. The TAQ tag will be associated with a name stem, unless marked as a Stranded Affix.
- 2.5.4.4.4. Surnames containing the prefix AL (e.g., AL IDRISI) will be specially marked.
- 2.5.4.5. The TAQ tag will assist in the sorting of records (see Section 2.12, the Arabic Filter and Sorter (AFS)).

#### 2.5.5. Subordinates

None.

### 2.6. ARABIC DATA EVALUATOR MODULE DECOMPOSITION

#### 2.6.1. Identification

This function is known as the Arabic Data Evaluator (ADE).

### 2.6.2. Type

The ADE is a function that "corrects" data entry errors by generating one or more alias records.

### 2.6.3. Purpose

Arabic names are conventionally a Given Name followed by a string of (usually paternal) relationships, elements of which are routinely deleted. Some data entry operators have apparently attempted to capture the fact that the Arabic name is closer to a single name string by entering XXX into the Given Name field, cf., presumably the XXX permitted in the COB or DOB fields. Because XXX is not a conventional representation of any Given Name information, it interferes with the name search and will be altered.

### 2.6.4. Function

The ADE will determine if the leftmost Given Name segment (only) is XXX. If so, it will change that string to FNU and generate an alias add record or query.

### 2.6.5. Subordinates.

None.

### 2.7. ARABIC SEGMENT POSITIONER MODULE DECOMPOSITION

#### 2.7.1. Identification

This function is known as the Arabic Segment Positioner (ASP).

#### 2.7.2. Type

The ASP is a processing module that operates on the preprocessed, regularized name and moves name segments from the Given Name field into the Surname field. Alias records will be produced to reflect format changes.

### 2.7.3. Purpose

Arabic names are made up of a Given Name (GN) (usually one, although compound names may occur: SAMIR; MUHAMAD ALI) and a string of familial (paternal) relations following the GN (ABD EL KADEER SAMIR ABD EL LATIF). This string is generally made up of GNs which are taken from the father, grandfather and other relations. In most cases, none of these segments be identified as a Surname, i.e., a name used by every member of the family to signal family membership. The full string following the GN provides crucial information about the individual that is lost if it is sometimes in the GN field and sometimes in the SN field. So, positioning names that occur after the first GN in the SN field provides the opportunity for better matches.

#### 2.7.4. Function

2.7.4.1. The ASP will move all segments to the right of the leftmost GN (GN1) (in the preprocessed; regularized name) to the leftmost SN position, preserving the order of the moved segments.

Figure 2: Movement of Segments into SN Field

FARUK, MUHAMAD SAMIR ABDULA	<b>→</b>	SAMIR ABDULA FARUK, MUHAMAD

2.7.4.2. The leftmost Given Name (GN1) segment will not be moved into the Surname field *except* 

- a) if there is one and only one GN segment and
- b) if there is one and only one SN segment which has been tagged as having the prefix AL,
- then the ASP will generate an alias record with the SN and GN inverted.

Figure 3: Inversion of SN and GN with AL in the SN Field

	SURNAME	GN1	
į	(AL) IDRISI	YUSEF	→
	YUSEF	(AL) IDRISI	

2.7.4.3. The GN1 may be a name segment, an initial, or FNU. (See Section 2.9, the Arabic Search Engine (ASE) for additional information.)

### 2.7.5. Subordinates

None.

### 2.8. ARABIC GENDER IDENTIFIER MODULE DECOMPOSITION

### 2.8.1. Identification

This function is known as the Arabic Gender Identifier (AGI).

### 2.8.2. Type

- 2.8.2.1. The AGI is a function that will apply after the ANR has produced a regularized representation of the input name and the Arabic Segment Positioner (ASP) has moved all GN segments other than the GN1 into the SN field.
- 2.8.2.2. For the AGI to derive record gender, the data input operator will need to supply gender for each record added to the database and for each query during the data entry process.

### 2.8.3. Purpose

- 2.8.3.1. Crossed-gender records are of little value to the system user.
- 2.8.3.2. Arabic gender is reliably predictable from the GN1.
- 2.8.3.3. Records that have crossed gender will receive lowered match values during the filtering and sorting process.
- 2.8.3.4. Record gender requires gender validation from two sources: gender received during the data entry process and predictable gender associated with Arabic names.
- 2.8.3.5. Record gender reduces the chance of associating gender with a name that may be misspelled.

### 2.8.4. Function

- 2.8.4.1. The AGI will derive the record gender for all record adds and queries.
  - 2.8.4.1.1. For each query and add name, the AGI will derive record gender from user-supplied gender input and from the gender that has been assigned to the GN1.
  - 2.8.4.1.2. A *minimum* of two gender indicators is required for a gender assignment of M or F.
- 2.8.4.2. For record adds, gender received as input from the data entry process will be stored with the record.
- 2.8.4.3. For record queries, the user will input the gender of the applicant at query time.
- 2.8.4.4. For both adds and queries, the AGI will access the Arabic Name Type Data Store (ANT) and will assign the gender value to the GN1 segment, as indicated in the ANT (GENDER). (See Section 3.5.)
  - 2.8.4.4.1. If the name is present in the ANT, the gender associated with the name segment will be compared to the data entry gender.
    - 2.8.4.4.1.1. If the gender indicators match, the matching value will become the record gender.

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# 2.8.4.4.1.2. If the gender indicators do not match, the record gender will be Unknown (U).

2.8.4.4.2. If the name is not present in the ANT, the record gender will be marked as Unknown (U).

#### 2.8.5. Subordinates

None.

### 2.9. ARABIC SEARCH ENGINE MODULE DECOMPOSITION

#### 2.9.1. Identification

This module is known as the Arabic Search Engine (ASE).

### 2.9.2. Type

The ASE is a processing module that accepts the output of the Arabic Preprocessor (APP), generates retrieval keys through the Arabic Key Generator, retrieves candidate records from the database based on the keys and submits those candidate records to the Arabic Filter and Sorter (AFS) Module.

### 2.9.3. Purpose

The regularized, repositioned names generated by the APP will be, in general, a representation of the canonical form of the Arabic name. The search process will benefit from focus on the canonical form of the Arabic name.

### 2.9.4. Function

The ASE will retrieve records from the database whose stored keys match the keys generated for the query record.

### 2.9.5. Subordinates

The ASE has one subordinate module:

Arabic Key Generator

### 2.10. ARABIC KEY GENERATOR MODULE DECOMPOSITION

#### 2.10.1. Identification

This function is known as the Arabic Key Generator (AKG).

### 2.10.2. Type

The AKG is a function that will form keys from the GN1 and each SN segment of the preprocessed, regularized name for both record adds and queries.

### 2.10.3. Purpose

In order to reduce the number of records that must be compared by the Arabic Filter and Sorter Module, it is desirable to subset the Arabic database. (About 500,000 records have qualified as Arabic through the ANI name typing process and it is assumed that this number will continue to represent the approximate size of an Arabic database.) One mechanism for achieving a

subset is to generate keys for the input name. The Arabic keys are motivated by the nature of the Arabic name and are centered around the most stable name segment in the Arabic name, the GN1.

- 2.10.3.1. The Arabic keys replace the compressed-name keys produced for Legacy ANA, which have severe limitations for retrieving both predictable and unpredictable variants of the regularized Arabic names.
- 2.10.3.2. For record adds, all keys will be stored with the source record.
- 2.10.3.3. Keys will be generated for each SN segment (moved or resident) and for each GN1.
  - 2.10.3.3.1. For record adds, more keys will be generated for HF name segments than for LF segments.
  - 2.10.3.3.2. Search keys will be a combination of SN keys and GN1 keys.

#### 2.10.4. Function

- 2.10.4.1. The AKG will form search keys from a combination of keys for each regularized segment in the Surname field and the regularized GN1.
- 2.10.4.2. Initials

All names that contain the same first character as the initial will qualify for retrieval on an initial.

#### 2.10.4.3. FNU

All GN1 names qualify for retrieval with a GN1 of FNU (First Name Unknown).

### 2.10.4.4. Search Keys

- 2.10.4.4.1. The AKG will generate a set of Search Keys for each input name by conjoining each GN1 key with each SN key of the regularized, repositioned input name.
- 2.10.4.4.2. All search keys generated for an add will be stored with the record add and associated with the regularized, repositioned form of the name.

### 2.10.4.5. Generating Keys

- 2.10.4.6. The AKG will produce two categories of keys:
  - Single-Part Key (SI): a key formed from the single name segment (SN or GN1). All Single-Part Keys will be used to form the Search Keys. There are three kinds of Single-Part Key:
    - Primary Key (PK): a key formed on a single name segment (SN or GN1) and used to define the set of keys for that segment;
    - Wild-Card Key (WK): a key based on the Primary Key that contains wild-card characters;
    - Special Key (SP): a key formed on a single name segment and intended to handle specific variation in the regularized name.

2. Search Key (SK): a multipart key that will be stored and used for retrieval, consisting of a combination of the keys associated with every SN segment and those associated with the GN1.

### 2.10.4.7. Single-Part Key (SI)

- 1. The Primary Key (PK)
  - The PK is formed from one name segment.
  - The PK has a maximum of three characters.
  - The PK has the form CCC or CC or C, where C represents any consonant (except in the leftmost position where C may be a vowel).
  - The PK is formed from the leftmost character (vowel or consonant) of the regularized segment and the following two consonants (including H, Y and W). If fewer than two additional consonants are available, then the PK may be shorter.
- 2. The Wild-Card Key (WK)
  - The WK is formed from the Primary Key.
  - The WKs will have the forms \*CC, C\*C, CC\*, where \* represents any consonant, except in the leftmost position where it may represent a vowel.
  - The WK will have the forms C\* and \*C with segments that have only two candidate characters.
  - A WK will not be formed from a Primary Key with only 1 component (i.e., C).

Figure 4: Example: Formation of Primary and Wild-Card Keys

SEGMENT	PRIMARY KEY	WIL	WILD-CARD KEYS	
GAMILA	GML	*ML	G*L	GM*
ABASI	ABS	*BS	A*S	AB*
SAID	SD	*D	S*	
DAI	D	none		<u> </u>

### 2.10.4.7.1. Special Key (SP)

- 2.10.4.7.2. The AKG will produce Special Keys (SP) to accommodate situations that cannot be accommodate by the ARR.
- 2.10.4.7.3. The AKG will generate the Special Keys in addition to the Primary and Wild-Card Keys.

### 2.10.4.7.3.1. K-Key

- 2.10.4.7.3.2. The character K alternates with null in many Arabic names, resulting in the potential overlap of many names with the K names.
- 2.10.4.7.3.3. This phenomenon is not readily handled by the ARR, so names with a K require a Special Key.

- 2.10.4.7.3.4. The K-Keys are formed in the following way:
  - 2.10.4.7.3.4.1. For any segment with K in initial position, the following keys are produced:

    \*CC where \* represents any character or nothing. (This key is equivalent to a WK produced for this name.)
  - 2.10.4.7.3.4.2. For any segment with K in medial position, the following keys are produced:
    - 1. CkC, where k represents the character "k";
    - CCC, where k has been deleted from the name string and the CCC represents the three leftmost consonants that remain; and
  - 2.10.4.7.3.4.3. For any segment with K in final position, the following keys are produced:
    - CCk, where k represents the character "k" and
    - CC, where k has been deleted from the name string and the CC represents the two leftmost consonants (or vowel in first position) that remain.
- 2.10.4.7.3.5. The standard set of Wild-Card Keys will also be produced from the Primary Key for K-names.
- 2.10.4.7.3.6. Record Add/Query: The AKG will generate and store all K-Keys with the segment.

Figure 5: Example: Formation of K-Keys

NAME SEGMENT / VARIANT	PRIMARY KEY	K - KEYS	WILD-CARD KEYS
KARSCH	KRS		*RS, K*S, KR*
ARSCH	ARS		*RS, A*S, AR*
MUKBEL	MKB	MBL	*KB, M*B, MK*
MUBEL .	MBL		*BL, M*L, MB*
FARUK	FRK	FR	*RK, F*K, FR*
FARU	FR	FR	.*R, F*

- 2.10.4.7.3.7. High Frequency Key (HK)
- 2.10.4.7.3.8. The AKG will generate Special Keys for High Frequency segments found in the input name.
- 2.10.4.7.3.9. The AKG will access the Arabic Name Type (ANT) Data Store to identify HF segments. (See Section 3.5.)

- 2.10.4.7.3.9.1. The ANT will contain a set of Arabic name types, the most frequently occurring of which will be specified as High Frequency name segments (HI\_FREQ = 1 (True)). (See Section 3.5 for details).
- 2.10.4.7.3.9.2. The AKG will tag as HF all name segments in the input record that match one of the ARABIC\_NAME\_TYPE segments for which HI\_FREQ = 1 (is True).
- 2.10.4.7.3.9.3. The AKG will tag all other name segments as LF.

### 2.10.4.7.3.10. Record Add/Query

2.10.4.7.3.11. The AKG will generate and store the Primary Key for any segment that has been tagged as a HF name segment.

### 2.10.4.7.3.12. Record Add

2.10.4.7.3.13. The AKG will generate and store all appropriate Wild-Card Keys for any segment that has been tagged as a HF name segment.

Figure 6: Example: Primary Key as HF Key

HF SEGMENT	PRIMARY KEY	WILD-CARD KEYS
MUHAMAD	МНМ	*HM, M*M, MH*
AHMED	AHM	*HM, A*M, AH*
ALI	AL	*L, A*

### 2.10.4.7.4. Search Keys (SK)

- 2.10.4.7.5. The Search Key is a multipart key formed from all keys associated with one SN segment and all keys associated with the GN1: e.g., \*CC + \*CC, \*CC + C\*C, C\*C + CC\*, etc.
- 2.10.4.7.6. The Search Keys will be the keys used for retrieval of records from the database.

### 2.10.4.7.7. Search Key Formation

- 2.10.4.7.8. To form the set of search keys that will be related to each input record, the AKG will combine each SN segment with the GN1 segment: SN1 + GN1, SN2 + GN1, etc.
- 2.10.4.7.9. The AKG will determine the frequency (HF or LF) of each of the conjoined segments.
- 2.10.4.7.10. The number and type of Search Keys will be based on the frequency of the name segments.

24

ANA-E Language Analysis Systems, Inc.

- 2.10.4.7.11. The AKG will form
  - · Standard Search Keys and
  - · HF Search Keys.
- 2.10.4.7.12. Standard Search Keys.(SS) ...
- 2.10.4.7.13. Standard Search Keys (SS) are formed for each SN and GN1 pair.
- 2.10.4.7.14. Record Add
- 2.10.4.7.15. To form a set of Standard Search Keys, the AKG will combine each Wild-Card Key and each K-Key of each SN segment with each Wild-Card Key and each K-Key of the GN1.
  - 2.10.4.7.15.1. For example, each segment with three characters (CCC) will have generated three Wild-Card Keys.
  - 2.10.4.7.15.2. When the keys from two segments with three characters each are paired, there will be a total of nine keys.
  - 2.10.4.7.15.3. For segments with fewer characters, there will be fewer than nine keys.
- 2.10.4.7.16. The AKG will generate and store these keys with the record.

Figure 7: Example: Formation of Standard Search Keys (Record Add)

REPOSITIONED, REGULARIZED INPUT FORMAT: AHMED BADAWI, MUHAMAD				
	GN1: MUHAMAD	STANDARD SEARCH KEYS		
SN1: AHMED	SNI+GNI: AHMED MUHAMAD	*HM*HM, *HMM*M, *HMMH*, A*M*HM, A*MM*M, A*MMH*, AH**HM, AH*M*M, AH*MH*		
SN2: BADAWI	SN2+GN1: BADAWI MUHAMAD	*DW*HM, *DWM*M, *DWMH*, B*W*HM, B*WM*M, B*WMH*, BD**HM, BD*M*M, BD*MH*		

- 2.10.4.7.17. Query
- 2.10.4.7.18. If either segment of the SN + GN1 pair has been tagged as LF, the AKG will generate the Standard Search Keys.
- 2.10.4.7.19. To form a set of Standard Search Keys, the AKG will combine each Wild-Card Key and K-Key of each SN segment with each Wild-Card Key and K-Key of the GN1. (See Section 2.10.4.7.15)
- 2.10.4.7.20. HF Search Keys (HS)
- 2.10.4.7.21. Query
- 2.10.4.7.22. If both segments (the, SN and the GN1) of the conjoined pair have been tagged as HF segments, the AKG will form one Search

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- Key from the Primary Key of the SN + the Primary Key of the GN1.
- 2.10.4.7.23. The High Frequency Search Key will be the *only* Search Key used for a *query* on the SN + GN1 pair when both segments are HF segments.

### 2.10.4.7.24. Record Add

- 2.10.4.7.25. If both segments (the SN and the GN1) that have been conjoined have been tagged as HF segments, the AKG will form one Search Key from the Primary Key of the SN + the Primary Key of the GN1.
- 2.10.4.7.26. The HS will be stored with a record add.
- 2.10.4.7.27. The HS will be a key stored in addition to the Standard Search Keys for the record.

Figure 8: Example: HF Search Keys

REPOSITIO	NED, REGULARIZED INPUT FORM	AT: AHMED ALI, MUHAMAD
	GN1: MUHAMAD (HF)	HF SEARCH KEYS
	THE STATE OF THE S	АНММНМ
SINZ: ALI (HF)	SN2+GN1: ALI MUHAMAD	ALMHM

## 2.11. Retrieval Function of the Arabic Search Engine (ASE)

- 2.11.1. The Arabic Search Engine (ASE) will retrieve records from the database based on the following criteria:
- An exact match of the query Search Keys and stored Search Keys and
- Refusal Code Level and associated Year-of-Birth Range.
- 2.11.2. The ASE will access the Refusal Code Level/Year-of-Birth Range (RLYOB) Data Store to determine the YOB range within each Refusal Level to search for candidate records.
- 2.11.3. The ASE will retrieve the unique ID and the regularized, repositioned form of the record.
  - 2.11.3.1. Determination of the proximity by the Arabic Filter and Sorter of the query and database records will be based on the regularized, repositioned form of the record.
  - 2.11.3.2. The ASE will eliminate all records with the same unique ID retrieved during the retrieval process.

### 2.11.4. Subordinates

Arabic Key Generator.

ANA-E Language Analysis Systems, Inc. 26

### 2.12. ARABIC FILTER AND SORTER MODULE DECOMPOSITION (AFS).

#### 2.12.1. Identification

This module is known as the Arabic Filter and Sorter (AFS).

#### 2.12.2. Type

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- 2.12.2.1. The AFS is a module that accepts each regularized database record retrieved by the ASE and compares it to the regularized form of the query record.
- 2.12.2.2. The AFS is constituted of two subordinate functions:
  - the Arabic Filter and
  - the Arabic Sorter.
  - 2.12.2.3. The AFS must follow the Arabic Search Engine (ASE).

#### 2.12.3. Purpose

- 2.12.3.1. The set of database records that the ASE will retrieve will have no value relative to the query record. The AFS will evaluate each of the records retrieved for its proximity to a query record, will retain those that pass a pre-established threshold and will sort the resultant candidate list.
- 2.12.3.2. The filtering process will take into account a number of factors that play a role in determining the relative value of Arabic names.

### 2.12.4. Function

2.12.4.1. The AFS will compare the query name and record name to determine a relative surname value and given name value and will generate a composite score for the records by accounting for Date-of-Birth, Refusal Level and Country-of-Birth proximity.

### 2.12.4.2. Arabic Filter Function of the AFS

- 2.12.4.3. The Arabic Filter and Sorter will first determine if the query record and prime database record (unregularized version) match exactly.
  - 2.12.4.3.1. The Surname, Given Name, Date-of-Birth and Country-of-Birth must be exact matches.
  - 2.12.4.3.2. If the two records match exactly, the AFS will tag the record as an exact match.
  - 2.12.4.3.3. The AFS will send the record directly to the Arabic Sorter Function.

- 2.12.4.4. The Arabic Filter and Sorter (AFS) will accept the regularized, repositioned candidate records retrieved by the ASE.
- 2.12.4.5. The AFS will perform a digraph comparison of the regularized, repositioned surname segments (stems) of the query record and each candidate record.
- 2.12.4.6. The AFS will perform a digraph comparison of the regularized given name segment (stem) of the query record (GN1) and the given name segment (stem) of each candidate record (GN1).
  - 2.12.4.6.1. The score produced by the digraph comparison (DI\_VAL) will be adjusted by values assigned to several parameters.
  - 2.12.4.6.2. The score assigned to the surname and to the given name, after the parameters have adjusted the DI\_VAL, will be the SN\_VAL and the GN\_VAL.
  - 2.12.4.6.3. Factors that contribute to the determination of the name scores (SN VAL and GN VAL) include
    - SNTHR
    - GNTHR
    - OPVAL
    - INITSN
    - INITGN
    - TAQASN
    - TAQAGN
    - TAQXSN
    - TAQXGNGNDR
  - 2.12.4.6.4. A final name score will be calculated for each candidate database record as it compares to the query record.
    - 2.12.4.6.4.1. A score for the SN will be calculated: SN\_VAL.
    - 2.12.4.6.4.2. A score for the GN will be calculated: GN\_VAL.
  - 2.12.4.6.5. To be included in the final candidate list, the SN\_VAL and GN\_VAL must each pass pre-determined SN and GN threshold levels (SNTHR and GNTHR).
- 2.12.4.7. Surname Evaluation
- 2.12.4.8. The AFS will perform a digraph comparison of each SN stem of the database record with each SN stem of the query record.
  - 2.12.4.8.1. The digraph value is determined in the following way:
    - 2.12.4.8.1.1. The digraphs are identified for each name stem.
      - 2.12.4.8.1.1.1. Each pair of alphabetic characters is identified: TAFIQ → TA/AF/FI/IQ

- 2.12.4.8.1.1.2. A digraph is also formed of the initial boundary (#) and the first alphabetic character:

  TAFIQ → #T.
- 2.12.4.8.1.1.3. A digraph is also formed of the final alphabetic character and the final boundary (#):

  TAFIQ → Q#.
- 2.12.4.8.1.2. The number of shared digraphs is calculated.
  - 2.12.4.8.1.2.1. A digraph may match one digraph only.
- 2.12.4.8.1.3. The number of shared digraphs is multiplied by 2 and divided by the total number of digraphs in Comparand #1 added to the total number of digraphs in Comparand #2.
  - 2.12.4.8.1.3.1. The formula is:

2 \* d / a + b, where d = the total number of shared digraphs; where a = the total number of digraphs in Comparand #1; and where b = the total number of digraphs in Comparand #2.

2.12.4.8.1.4. The result is the Digraph Value (DI\_VAL) for the two Comparands.

Figure 9: Example: Digraph Calculation

COMPARANDS	DIGRAPHS	SHARED DIGRAPHS	DI_VAL
COMPARAND #1: BADIR	#B BA AD DI IR R# (6 total digraphs = a)	BA AD DI IR R#	2*d/a+b= 10/13
COMPARAND #2: ABADIR	#A AB BA AD DI IR R# (7 total digraphs = b)	= 5 (d)	0.77

- 2.12.4.9. This process is performed for each of pair of Comparands in the database and query SN (SN1/SN1, SN1/SN2, SN1/SN3, SN2/SN2, etc.).
- 2.12.4.10. Each DI\_VAL is adjusted according to parameter values in the Filter Parameter Data Store (see Section 3.6 for details).
- 2.12.4.11. The AFS will determine if the appropriate parameter conditions are met
- 2.12.4.12. If the appropriate conditions are present, the DI\_VAL will be multiplied by the value assigned to the parameter and the relative score of the two Comparands will be lowered.

#### 2.12.4.13. Parameter Conditions

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- 2.12.4.13.1. INITSN: Surname Initial
  - 2.12.4.13.1.1. Definition: A SN segment is a single character and it matches the first character of the other comparand.
  - 2.12.4.13.1.2. Action: Assign the INITSN value to the comparison value (i.e., do not calculate the DI\_VAL).
- 2.12.4.13.2. OPSN: Out-of-Place Surname
  - 2.12.4.13.2.1. Definition: A SN segment that is not in the same relative position in the SN string in both the database and query records.
  - 2.12.4.13.2.2. Action: Multiply the DI\_VAL by the OPSN value. (See Figures 10 and 11.)
- 2.12.4.13.3. TAQ Filter
- 2.12.4.13.4. All TAQ tags (ID\_NO, disposition, TAQ\_TYPE and associated SN stem) will be retrieved with the database record.
- 2.12.4.13.5. The AFS will evaluate any TAQs associated with the SN segments being evaluated, except Stranded Affixes (see Section 2.5.4.2.7.3).
  - 2.12.4.13.5.1. A Stranded Affix will not play a role in the prefix comparison.
- 2.12.4.13.6. Single TAQs
- 2.12.4.13.7. Missing TAQs
- 2.12.4.13.8. TAQASN: Absent TAQ Value
  - 2.12.4.13.8.1. Definition 1: One of the two comparands has a TAQ tag, the other does not.
  - 2.12.4.13.8.2. Definition 2: Both SN segments have a single TAQ tag, one is a TAQ DELETE, the other a TAQ DISREGARD.

ANA-E Language Analysis Systems, Inc. 30

2.12.4.13.8.3. Action: Multiply the DI\_VAL by the TAQASN value. (See Figures 12 and 22.)

#### 2.12.4.13.9. TAQ DELETE

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- 2.12.4.13.9.1. If the TAQ DELETE tags refer to the same TAQ segment, the DI VAL will be unchanged.
- 2.12.4.13.9.2. If the TAQ DELETE tags refer to different TAQ DELETE segments, multiply the DI\_VAL by the TAQXSN value. (See Figure 22.)

### 2.12.4.13.10. TAQ DISREGARD Processing

- 2.12.4.13.10.1. The AFS will access the TAQ Filter Data Store (TF) to process SN TAQ segments that have been tagged as DISREGARD.
- 2.12.4.13.10.2. Definition: The AFS will access the TAQ Filter
  Data Store (TF) to process records if they both contain
  SN TAQ segments that have been tagged as
  DISREGARD.
- 2.12.4.13.10.3. Action 1: The AFS will assign TAQDIS#1 to the TAQ DISREGARD segment for the database SN segment and TAQDIS#2 to the TAQ DISREGARD segment for the query SN segment.
- 2.12.4.13.10.4. Action 2: If the two TAQ DISREGARD segments match, the DI\_VAL will remain unchanged.
- 2.12.4.13.10.5. Action 3: If the two TAQ DISREGARD segments do not match, the AFS will identify the TF\_VALUE for the pair in the TF. (See Figure 24.)
  - 2.12.4.13.10.5.1. The AFS will multiply the DI\_VAL by the TF\_VALUE for the pair.

### 2.12.4.13.11. Multipart TAQs

- 2.12.4.13.11.1. Definition: If at least one SN comparand has multipart TAQ tags (they may be all DISREGARD, all DELETE, or mixed DISREGARD/DELETE), the AFS will perform the following analyses.
- 2.12.4.13.11.2. Action: If all TAQs match, AFS will make no change in the DI\_VAL.

### 2.12.4.13.11.3. TAQ DELETEs

- 2.12.4.13.11.3.1. Definition: All DELETE tags
- 2.12.4.13.11.3.2. Action 1: If any DELETE TAQ matches, the AFS applies no change.

2.12.4.13.11.3.3. Action 2: If no DELETE TAQs match, multiply the DI\_VAL by the TAQXSN Value.

### 2.12.4.13.11.4. TAQ DISREGARDs

- 2.12.4.13.11.4.1. Definition: All DISREGARD tags
- 2.12.4.13.11.4.2. Action 1: If any TAQ DISREGARD segment matches, the AFS will make no . change in the DI VAL.
- 2.12.4.13.11.4.3. Action 2: If no TAQ DISREGARD segments match, the AFS will identify the highest match value from the TF (TF\_VALUE) and multiply that by the DI\_VAL. (See Figures 23 and 24.)

### 2.12.4.13.11.5. TAQ DISREGARD and DELETEs

- 2.12.4.13.11.5.1. Definition: Mixed DISREGARD/DELETE tags
- 2.12.4.13.11.5.2. Action 1: If DISREGARD segments are present in both comparands and there is any match among the DISREGARD segments, the AFS will make no change in the DI VAL.
- 2.12.4.13.11.5.3. Action 2: If DISREGARD segments are present in both comparands and there is no match among the DISREGARD segments, the AFS will determine the highest match value from the TF for any DISREGARD tags and multiply the DI\_VAL by that value. (That is, ignore any DELETE tags.)
- 2.12.4.13.11.5.4. Action 3: If a DISREGARD segment is in one comparand and not the other and the two comparands have at least one DELETE tag that matches, the AFS will make no change in the DI\_VAL.
- 2.12.4.13.11.5.5. Action 4: If a DISREGARD segment is in one comparand and not the other and the two comparands have DELETE tags that do not match, multiply the DI\_VAL by the TAQXSN. (See Figure 22.)
- 2.12.4.14. After all evaluations have been performed, the AFS will choose the highest score for each name segment.
  - 2.12.4.14.1. The highest score for both the row and column must be chosen.

ANA-E Language Analysis Systems, Inc.

. 32

2.12.4.14.2. Only one score per row and column is permitted.

2.12.4.14.3. If two scores are equal, only one is chosen.

Figure 10: Example 1: Digraph Evaluation: Equal Number of SN Segments; Digraph Variants BADAWI/BEDAWI

	AHMED	ALI	BADAWI
AHMED	1.00	0.20	0.00
ALI	0.20	1.00	0.18
BEDAWI	0.15	0.18	0.71

Figure 11: Example 2: Digraph Evaluation: Different Number of SN Segments; OPSN applies to BADAWI/BEDAWI

	AHMED	ALI	BADAWI
AHMED	1.00	0.20	0.00
BEDAWI	0.15	0.18	0.61

Figure 12: Example 3: Digraph Evaluation: Same Number of SN Segments; TAQ Tag Present on One SN

4111600	(ABU) AHMED	SALIM	SAYED
AHMED	0.90	0.00	0.28
SAID	0.00	0.36	0.47
AKBAR	0.16	0.00	0.00

Figure 13: Example 4: Digraph Evaluation: Same Number of SN Segments; Different TAQ\_DISREGARD Segments Present

(DIN) ATTACED	(ABU) AHMED	SALIM	SAYED
(BIN) AHMED	0.50	0.00	0.28
SAID	0.00	0.36	0.47
AKBAR	0.16	0.00	0.00

2.12.4.15. The AFS will sum the values chosen from the comparison matrix and will divide by the number of values chosen to produce the SN\_VAL.

2.12.4.15.1. In Example 1, 1.00 + 1.00 + 0.61/3 = 0.87

2.12.4.15.2. In Example 2, 1.00 + 0.61/2 = 0.81

2.12.4.15.3. In Example 3, 0.90 + 0.47 + 0.00/3 = 0.46

2.12.4.15.4. In Example 4, 0.50 + 0.47 + 0.00/3 = 0.32

2.12.4.16. The AFS will compare the SN\_VAL to the SNTHR.

2.12.4.16.1. The SN\_VAL must be equal to or greater than the SNTHR.

2.12.4.16.2. The record must pass the SNTHR to qualify for the final candidate list.

## 2.12.4.17. Given Name Evaluation

- 2.12.4.18. The GN has only one segment, the GN1.
  - 2.12.4.18.1. The AFS will perform a digraph comparison on the regularized GN1 stem of the database record and the regularized GN1 of the query record.
  - 2.12.4.18.2. The DI\_VAL will be calculated as it was for the SN (see Section 2.12.4.8).
  - 2.12.4.18.3. The DI\_VAL will be adjusted by several GN parameters.
  - 2.12.4.18.4. INITGN: Given Name Initial
    - 2.12.4.18.4.1. Definition: A GN1 is a single character and matches the first character of the GN1 of the other comparand.
    - 2.12.4.18.4.2. Action: Assign the INITGN value to the comparison value (i.e., do not calculate a DI\_VAL)
  - 2.12.4.18.5. TAQ Evaluation will proceed as with the SN, mutatis mutandi (see Section 2.12.4.13.3).
  - 2.12.4.18.6. GNDR: Record Gender Value
    - 2.12.4.18.6.1. The AFS will compare the record gender of the input name and the query name.
    - 2.12.4.18.6.2. If the genders match, no action will take place.
    - 2.12.4.18.6.3. If the genders do *not* match, multiply the DI\_VAL of the GN1 by the GNDR value. (See Figure 24.)
- 2.12.4.19. The value resulting from all GN1 calculations will be the GN\_VAL.
- 2.12.4.20. The AFS will compare the GN\_VAL to the GNTHR. (See Figure 24.)
  - 2.12.4.20.1. The GN\_VAL must be equal to or greater than the GNTHR.
  - 2.12.4.20.2. The record must pass the GNTHR to qualify for the final candidate list.

- 2.12.4.21. Composite Score
- 2.12.4.22. The AFS will develop a Composite Score for the two comparands.
- 2.12.4.23. The AFS will adjust the GN\_VAL and the SN\_VAL by factors that reflect the proximity of the Refusal Level, Date of Birth and Country of Birth.
- 2.12.4.24. The GN\_VAL and SN\_VAL will be multiplied by factors that apply to the RL, DOB and COB.
- 2.12.4.25. Refusal Level Factor
- 2.12.4.26. The AFS will access the Refusal Code Level Data Store to determine the Refusal Level Category of the Refusal Code.
- 2.12.4.27. The AFS will access the Filter Parameter Data Store to find the PARM\_VAL associated with the Refusal Level (RL#).
- 2.12.4.28. Date-of-Birth Factor
- 2.12.4.29. The AFS will access the Year-of-Birth Range Data Store to determine the YOB Category, YOB#, of the Dates-of-Birth of the comparands. The highest value is applied to the relationship.
- 2.12.4.30. The AFS will access the Filter Parameter Data Store to find the PARM\_VAL associated with the YOB Category (YOB#).
- 2.12.4.31. Country-of-Birth Factor
- 2.12.4.32. The AFS will access the Country of Birth Category Data Store to determine the COB Category, COB#.
- 2.12.4.33. The AFS will access the Filter Parameter Data Store to find the PARM\_VAL associated with the Country of Birth Category (COB#).
- 2.12.4.34. The AFS will calculate a composite score by multiplying the SN\_VAL by the GN\_VAL by the RL# PARM\_VAL by the YOB# PARM\_VAL by the COB# PARM\_VAL.
- 2.12.4.35. Final Sort Function of the AFS
- 2.12.4.36. The AFS will rank order the final candidate list of database records.
- 2.12.4.37. The prime (unregularized) record will be returned to the user.
  - 2.12.4.37.1. There may be significant differences between the query record and the qualifying database records.
  - 2.12.4.37.2. The Composite Score will be returned with the record.

- 2.12.4.38. Any record that is tagged as an exact match will be placed at the top of the list.
- 2.12.4.39. All remaining records in descending order of Composite Score.
- 2.12.4.40. The goal of the final sort is to place exact record matches on the top and to rank order the remaining records by the degree of contribution that each data element (SN, GN, DOB, COB, Refusal Code Level (RL)) makes to the overall record value.
- 2.12.4.41. The details of the sort will be derived from extensive discussion about the business requirements.
- 2.12.4.42. Because the scores from the various pipes may not have been calculated in the same way, a method for evaluating the relative value of candidate records will have to be devised.

#### 2.12.4.43. Internal Order

- 2.12.4.43.1. There may be cases in which the sorting criteria are met equally by more than 1 record.
- 2.12.4.43.2. Where multiple records qualify equally, there will be an internal sort order.
  - 2.12.4.43.2.1. SN Score
  - 2.12.4.43.2.2. GN Score
  - 2.12.4.43.2.3. DOB Levels
  - 2.12.4.43.2.4. Refusal Levels
  - 2.12.4.43.2.5. COB Relationships
- 2.12.4.44. The AFS will return the top n records to the central CLASS-E sorter.
  - 2.12.4.44.1. The number of records to be returned will be a system setting.

### 2.13. LINGUISTIC TRACE FACILITY MODULE DECOMPOSITION

### 2.13.1. Identification

This module is known as the Linguistic Trace Facility (LTF).

#### 2.13.2. Type

The LTF is a program that will interact with any or all modules and functions within those modules.

### 2.13.3. Purpose

The LTF will allow system evaluators to access information about the system functions so that the quality of the content can be ensured. To diagnose and remedy problems associated with questionable system results, evaluators must

have access to the results of system functionality at various points during the processing cycle.

#### 2.13.4. Function

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- 2.13.4.1. The LTF will be a mechanism that will copy and divert statistics, information, processing results to a file outside the main processing module.
- 2.13.4.2. The file will be readily accessible on-line for examining by a system evaluator.
- 2.13.4.3. Multiple trace points will be identified when the system is built.
- 2.13.4.4. Examples of trace points:
  - What ARRs (by ID NO) have applied
  - Regularized, repositioned name form
  - All keys generated for a query and for an add
  - SN and GN DI\_VAL
  - SN\_VAL and GN\_VAL
  - Record Gender
  - Sort considerations

#### DATA DECOMPOSITION

### 3.1. DATA

- 3.1.1. The input data for an ANA-E query will contain all information that is currently required by CLASS and in the standard format required by CLASS.
  - NAME (Surname, Given Name);
  - DOB (Date of Birth; Day Month Year); and
  - COB (Country of Birth; FIPS codes).

In addition, the following will be specified:

- Applicant Gender (AG): Male (M), Female (F), Unknown (U).
- A unique identifier (UID) (as defined in CLASS-E).
- 3.1.2. For adds, other record information will be entered, as required by CLASS and CLASS-E: e.g., refusal code, province of birth.

### 3.2. DATA STORES

The following data stores will be accessed by the ANA-E processing components:

- Arabic Regularization Rules Data Store (ARR)
- Arabic Title/Affix/Qualifier Data Store (ATD)
- Arabic Name Type Data Store (ANT)
- Filter Parameter Data Store (FP)
- TAQ Filter Data Store (TF)
- Refusal Code Level Data Store (RCL)

- YOB Range Data Store (YR)
- Refusal Code Level/Year-of-Birth Range Data Store (RLYOB)
- COBPROX Data Store (COBPROX)
- Arabic COB Category Data Store (ACOB)

### 3.3. ARABIC REGULARIZATION RULES DATA STORE DECOMPOSITION

#### 3.3.1. Identification

This rule base is known as the Arabic Regularization Rule Base (ARR).

### 3.3.2. Type

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- 3.3.2.1. The ARR is a set of transformation rules accessed by the Arabic Rule Engine.
  - 3.3.2.2. The ARR will have the following format:

Figure 14: Format: Arabic Regularization Rule Base

FIELD NAME	DATA TYPE	FIELD SIZE	DATA VALUE
ID_NO	integer	3	001999
PRE-CONTEXT	character	unlimited	any ASCII character
IN	character	unlimited	any ASCII character
POST-CONTEXT	character	unlimited	any ASCII character
OUT	character	unlimited	any ASCII character

### 3.3.2.3. Definitions

- 3.3.2.3.1. ID\_NO: a unique, arbitrary numerical reference to the rule.
- 3.3.2.3.2. PRE-CONTEXT: preceding context for the element to be matched; delimited by preceding and following quotation marks ("")
- 3.3.2.3.3. IN: the match context; the portion of the name that will undergo change; delimited by preceding and following quotation marks ("")
- 3.3.2.3.4. POST-CONTEXT: trailing context for the element to be matched; delimited by preceding and following quotation marks ("")
- 3.3.2.3.5. OUT: the rule output; the realized change in the IN; delimited by preceding and following quotation marks ("")

- 3.3.2.4. There is no internal limit on the size of the Pre-Context, In, Post-Context or Out, although the system may have an external limit (e.g., the maximum size of the SN field).
- 3.3.2.5. All rules will use standard regular expression notation, with one exception (\$), which has been defined specifically for this rule base.

### 3.3.2.6. Regular Expression Notation

Figure 15: Regular Expression Notation

REGEXP NOTATION	DEFINITION	
ŧ.	Matches any single character, including white space.	
-	Stands for all characters that come between the two characters given. This is a standard "fromto" notation; with characters, it presumes an A to Z character set. For example, [A-D] will match on A or B or C or D. (See [] below.)	
[]	Identifies a class of characters; a match can occur on a single occurrence of any single element within the []: [OU] will match O or U. For example, "J[OU]N" will match on JON or JUN but not on JOUN. If a + is added to the bracketed expression, "J[OU]+N", it will match on any combination of any number of Os and Us: JOUUN, JUUON, JOUOUN, JUUN, JOUUN, etc. In contrast, OU without [] will match only on the exact combination of characters OU: "JOUN" will match on JOUN only.	
+	Matches one or more occurrences of a preceding character or regular expression, in any order.  For example, JO+N will match JON or JOON or JOOON, etc., [OU]+ matches OOOU or OUOUOU or O or UO or OOU or UUUO, etc.	
?	Matches zero or <i>one</i> occurrence of the preceding regular expression. The expression "JOH?N" will match on JON or JOHN but will not match on JOHHN.	
•	Matches zero or more occurrences of the preceding regular expression. The expression "JOH*N" will match on JON, JOHN, JOHHN, JOHHHHN, etc.	
()	Groups together regular expressions. "(J[OU]N H[AE]RRY)" will match on JON or JUN or HARRY or HERRY. (Contrast with [] which identifies a character class and contrast with {} which identifies a metasymbol.)	
1→(1)	Matches either the preceding regular expression or the following regular expression. The full expression is all contained within (). For example, (AB AP) will match the character string AB or AP. The same expression may also be written A[BP].	
4.11	Defines the context boundary: the Preceding Context, Match Context, Post Context and Output. A context that is made up of only one metasymbol and is not bracketed by {·} should not be surrounded by "". For example, the metasymbol Consonant can stand alone. If the metasymbol is enclosed within {}, then all regular expressions contained within the context must be enclosed within "". For example, "{Consonant} {Letter}" within one context requires both {} and "".	
. ()	Contains one or more pre-defined metasymbols. If { } are used, they must be surrounded by "". If a single metasymbol occurs alone, no { } are necessary and therefore no "" are necessary. For example, the single metasymbol Vowel can appear either as Vowel or "{Vowel}". If more than one element is used, the metasymbol must all appear within { } and the whole string within "". E.g., Vowel, "{Vowel}", "J{Vowel}HN" are acceptable formats.	
\$	Indicates the character to output. \$ is defined differently from other standard definitions. \$ is a variable that is followed by an integer that references a character in the match string. For example, each character in an input string is associated with a different, consecutive integer value, up to the number of characters in the match: JONES becomes J = \$1, O = \$2, N = \$3, E = \$4, S = \$5. Reference can be made to the index values in the output string. \$1 \$2 \$2 \$3 \$3 \$5 would represent JOONNS.	

### 3.3.2.7. Metasymbols

A number of meta-symbols will be accessed by the rules. The metasymbols are variables declared at the beginning of the ARR Data Store.

Figure 16: ARR Metasymbols

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METASYMBOL	DEFINITION
Letter	"[A-Z]"
Consonant	"[BCDFGHJKLMNPQRSTVWXYZ]" (N.B. Includes W and Y)
Nog (= No Glide)	"[BCDFGHJKLMNPQRSTXZ]" (N.B. No W or Y)
Alla	"[AEOUI]+L+[EA]+H?"
Rhyme	"[AEIOUY]+[BCDFGHJKLMNPQRSTVWXYZ]"
Kesra	"([EA]?[IY]+ [IE]+ Y)"
Dad	"(Z+ TH+ DH+ DD+)"
Tha	"(Z+ TH+ DH+ C+ S+ T+)"
Jim	"(DJ J Y G DZH DSCH GG DY)"
Gine	"(G GH RH)"
Qaf	"(Q G K J KH GH C QU CK)"
Kha	"(KH K X Q C)"
Marbuta	"([EAI]H [AE]T?)"
Sun	"(C S N D T R Z G J)"
Sungem	"(SS NN DD TT RR ZZ GG JJ)"
Moongem	"(BB FF GG HH JJ KK MM NN PP QQ VV WW XX)"
Vowelgem	"(AA EE II OO UU)"
Vowel	"[AEIOU]"
Didi	"(KHKH SHSH GHGH RHRH DHDH THTH CHCH PHPH)"
Dig	"[KSGRDTCP]H"
Bound	" " (= white space)
Anything	11 11
Othergem	"(CC LL YY)"

### 3.3.2.8. Purpose

The ARR allow records with highly divergent spellings and/or representations of the same name to be retrieved from the database. Usual character comparison techniques are unable to retrieve records with these variants.

#### 3.3.2.9. Function .

The ARR applies relevant rules to each Arabic name field and produces a common representation for variant realizations of the same name.

MUHAMMED, MOHAMMAD and IMHEMED are variant forms of the same name; each will be set equal to one single representation of the name: MUHAMAD, for example. The successful application of one or more rules will produce as output a regularized Arabic name string.

### 3.3.2.10. Examples

3.3.2.10.1. Example 1 contains two rules that apply to variants of ABDULLA:

ANA-E Language Analysis Systems, Inc. 40

- EVDILLAH
- ABD ALA
- ABDU ALLA
- ABDULLAH
- OABDELA
- AABDILA
- ABDELILA

Figure 17: Example 1: "ABDULLA" Regularization Rules

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۱.	ID NO	PRE- CONTEXT	IN (MATCH CONTEXT)	POST- CONTEXT	OUT
- 1	.676	Bound	"[HKCQ]?[AE]+[BV]*D+{Vowel}?{Bound}{Alla}"	Bound	"abdula"
	677	Bound	"[HKCQ]?[AE]+[BV]*D+[AEIOU]*L+[IE]*L*AH?"	Bound	"abdula"

3.3.2.10.2. Example 2 contains one rule that applies to variants of G:

- MAGUID
- MADZHID
- MADSCHID
- MADJID
- МАЛО
- GHASSAN

Figure 18: Example 2: "G" Regularization Rules

	ID NO	PRE- CONTEXT	IN (MATCH CONTEXT)	POST-CONTEXT	OUT
T	132	Anything	"(DJ GH DSCH DZH J+)"	Anything	"g"

### 3.4. · ARABIC TITLE/AFFIX/QUALIFIER DATA STORE DECOMPOSITION

Because the ANA-E design is viewed as an independent sub-program of the CLASS-E system, the Arabic Title/Affix/Qualifier Data Store is presented here as a separate table. It is strongly suggested, however, that CLASS-E support one TAQ Data Store in which the cultural affinity of each TAQ segment is indicated. This is reduce table maintenance and will provide a global picture of the handling of TAQs.

### 3.4.1. Identification

This data store is known as the Arabic Title/Affix/Qualifier Data Store (ATD).

### 3.4.2. **Type**

The ATD is a data store that contains the Arabic-specific Title, Affix and Qualifier segments and their distribution. It will be accessed by the Arabic Preprocessor (APP) and the Arabic Filter and Sorter.

Figure 19: Format: Arabic TAQ Data Store

DATA FIELD	DATA TYPE	FIELD SIZE	DATA VALUE
ID_NO	integer	4	19999
TAQ FORM	character	15	alphabetics
TAQ TYPE	character	1	T, P, I, S, Q
DELETE	integer	1	1, 0 (True, False)
DISREGARD	integer	1	1, 0 (True, False)

#### 3.4.2.1. Definitions

- 3.4.2.1.1. ID\_NO: a unique, arbitrary number that identifies the TAQ segment.
- 3.4.2.1.2. TAQ FORM: the string that represents the TAQ; the TAQ FORM may be a multipart string (i.e., a string that includes internal white space).
- 3.4.2.1.3. TAQ TYPE: an indicator of the kind of TAQ segment present: a title (T), prefix (P), infix (I), suffix (S) or qualifier (Q).

### 3.4.2.1.4. DELETE:

- 3.4.2.1.4.1. The segment is to be removed from all further consideration in the name search process; it will contribute marginally to the filtering process. It will be returned with the record to the user.
  - 3.4.2.1.4.2. The segment is referenced in the filtering process.
  - 3.4.2.1.4.3. The segment is not removed from the original record and is returned with the record to the user.
- 3.4.2.1.4.4. True (1) or False (0) indicates whether or not this function is to apply to the segment(s) under consideration.

### 3.4.2.1.5. DISREGARD:

- 3.4.2.1.5.1. The segment is to be removed from further consideration in the name search process but will undergo special evaluation in the filtering process. It will be returned with the record to the user.
- 3.4.2.1.5.2.True (1) or False (0) indicates whether or not this function is to apply to the segment(s) under consideration.

### 3.4.3. Purpose

Peripheral elements (Titles, Affixes, and Qualifiers) in names do not contribute as much to the name evaluation as does the name stem. Identifying and

removing these elements in the name processing component is important. They do, however, contribute to the overall value of a name when compared to another name. They will therefore contribute some value to the filtering and sorting processes.

### 3.4.4. Function

The ATD serves as a repository for all TAQ values and for the treatment that each will be subjected to.

### 3.5. ARABIC NAME TYPE DATA STORE DECOMPOSITION

### 3.5.1. Identification

This data store is known as the Arabic Name Type Data Store (ANT).

### 3.5.2. Type

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- 3.5.2.1. The ANT is a data store of unique regularized Arabic name segments.
- 3.5.2.2. The ANT is generated only after regularization has applied to the input name.
- 3.5.2.3. The ANT will have the following format:

Figure 20: Format: Arabic Name Type Data Store

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE
ID_NO	integer	5	0000199999
ARABIC_NAME_TYPE	character	24	alphabetics
GENDER	character	1	M, F, U
HI_FREQ	integer	1	1, 0 (True or False)

- 3.5.2.4. Definitions
- 3.5.2.5. ID\_NO: a unique, arbitrary numerical reference to the name segment (ARABIC NAME\_TYPE)
- 3.5.2.6. ARABIC\_NAME\_TYPE: unique entries that correspond to the *regularized* form of a name segment.
- 3.5.2.7. GENDER: the gender associated with a particular name segment: M (Male), F (Female), U (Unknown/Unspecified). As records are added to the ANT, gender will be specified as U. The gender assigned to new table entries will be periodically reevaluated so that names that can be identified for gender can be appropriately marked.
- 3.5.2.8. HI\_FREQ: the frequency of all names will be indicated. True (1) will indicate that a name segment is considered a high frequency Arabic name segment. All other segments will be marked as False (0), a low-frequency name segment.

#### 3.5.3. Purpose

The purpose of the ANT data store is to reduce the need to perform repeated digraph comparisons on a large store of names and to permit the retrieval of gender-matching records.

## 3.5.4. Function

The ANT will provide information about the distinct Arabic name types, their frequency and gender.

#### 3.6. FILTER PARAMETER DATA STORE DECOMPOSITION

#### 3.6.1. Identification

This module is known as the Filter Parameter Data Store (FP).

#### 3.6.2. Type

- 3.6.2.1. The FP is a data store that will be accessed by the Filter Component of the Arabic Filter and Sorter (AFS).
- 3.6.2.2. The FP is a parameter table that will be accessible to and adjustable by the user and whose cell values will be determined through testing and comparative evaluation.
- 3.6.2.3. The FP has the following format:

Figure 21: Format: Filter Parameter Data Store

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
PARM NAME	character	6	alphabetics	SNTHR, GNTHR,
_	'			OPSN, INITSN,
				GNDR, INITGN,
	1		•	TAQASN, TAQAGN,
				TAQXSN, TAQXGN,

		RL#, YOB#, COB#
	4 0.001.99	Various (TBD)
PARM_VAL decimal		

Figure 22: Example: Filter Parameter Data Store (Values are for example only.)

Figure 22: Exam	ipie: Filler Farameter
PARM_NAME	PARM_VAL
SNTHR	0.60
GNTHR	0.65
OPSN	0.60
INITSN	0.85
INITGN	0.85
GNDR	0.65
TAQASN	0.90
TAQAGN	0.90
TAQXSN	0.85
TAQXGN	0.85
RL0	1.20
RLI	1.15
RL2	1.10
RL3	1.05
RL4	1.00
YOB0	1.30
YOBI	1.25
YOB2	1.20
YOB3	1.15
YOB4	1.10
YOB5	1.05
YOB6	1.00
COBI	1.20
COB2	1.15
COB3	1.10
COB4	1.00
COB5	0.95

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3.6.2.4. The values provided are as examples only and do not necessarily represent the PARM\_VALs to be used for the parameters.

# 3.6.3. Purpose

The FP is a data store that allows easy access to adjustable parameters that contribute to the determination of the composite score of two record comparands.

# 3.6.4. Function

The FP functions as an independent data store with all the adjustable parameters needed by the AFS during the filtering process.

# TAQ FILTER DATA STORE DECOMPOSITION

# 3.7.1. Identification

This data store is known as the TAQ Filter Data Store (TF).

## 3.7.2. Type

- 3.7.2.1. This TF will be accessed by the Arabic Filter and Sorter and provides parameter factors for matching TAQ DISREGARD tags during record filtering.
- 3.7.2.2. The format of the TF follows:

Figure 23: Format: TF Matrix Design

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
TAQDIS#1	character	8	alphabetics	TAQ_DISREGARD ITEM
TAQDIS#2	character	8	alphabetics	TAQ_DISREGARD ITEM
TF VALUE	decimal	-4	0.001.00	Various (TBD)

#### 3.7.2.3. Definitions

- 3.7.2.4. TAQDIS#1: is the TAQ DISREGARD segment that occurs in one or the other (different) of the comparands.
- 3.7.2.5. TAQDIS#2: is the TAQ DISREGARD segment that occurs in one or the other (different) of the comparands.
- 3.7.2.6. TF\_VALUE: is the factor that will be used to adjust the SN\_VAL or GN\_VAL if the TAQDIS#1 and TAQDIS#2 are present in the comparands.

Figure 24: Example: TF Sample (Values are for example only)

TAQDIS#1	TAQDIS#2	TF_VALUE
ABD EL	ABD EL	1.00
ABD EL	ABU	0.75
ABD EL	AL	0.85
ABD EL	BIN	0.75
ABD EL	EL DIN	0.50
ABU	ABU	1.00
ABU	AL	0.85
ABU	BIN -	0.50
ABU	EL DIN	0.85
AL	AL	1.00
AL	BIN	0.85
AL	EL DIN	0.50
BIN	BIN	1.00
BIN	EL DIN	0.85
EL DIN	EL DIN	1.00

#### 3.7.3. Purpose

Arabic names often have peripheral name elements. Some of these make up a segment of the name, the TAQ values identified in the TF. Their relative value, however, varies. Some of them cannot cooccur, some have opposite

meanings, so it is necessary to identify their relative value when they are contrasted with one another.

#### 3.7.4. Function

The TF provides the resources for the AFS to determine the relative value of two TAQs that occur in two comparands.

#### 3.8. REFUSAL-CODE LEVEL DATA STORE DECOMPOSITION

#### 3.8.1. Identification

This data store is known as the Refusal Code Level Data Store (RCL).

#### 3.8.2. Type

- 3.8.2.1. It is recommended that the RCL be a parameter file, which can be accessed by the client so RC categories can be added to or changed with ease.
- 3.8.2.2. The RC data store will provide a list of the Refusal Codes and the level of seriousness of each Refusal Code.
- 3.8.2.3. The RCL has the following format:

Figure 25: Format: Piece of Refusal Code Level Data Store (RCL)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE	CATEGORY DEFINITION
00	alphanumerics	3	RL0	Most serious RC: 00
23	alphanumerics	3	RLI	Type 1 Serious RCs
6C	alphanumerics	3	RL2	Type 2 Serious RCs
07	alphanumerics	3	RL3	Type I Non-serious RCs
G	alphanumerics	3	RL4	Type 2 Non-serious RCs

## 3.8.2.4. Definitions

- 3.8.2.4.1. DATA FIELD: indicates each Visa Refusal Code (Codes and their Refusal Level (see VALUE) are for example only; they do not represent the complete list nor the accurate assignment of a Refusal Code to a Refusal Level).
- 3.8.2.4.2. DATA TYPE: The RL# will appear in the form RL1, RL2, etc.
- 3.8.2.4.3. VALUE: RL# is the Refusal Level category to which are particular Refusal Code has been assigned. The Visa Office will assign Refusal Codes to one of 4 categories: RL1, RL2, RL3, RL4, RL0 is reserved for the Refusal Code 00. (The current distinction among Refusal Codes is a binary one: serious and non-serious. Assignment of Refusal Codes to more groups has not yet been done; the consequence is that one or more of these categories may not have a distinct value.) The RL# occurs in

ascending order, from most serious to least serious Refusal Code. The RL# will be linked to a Year-of-Birth Code (see Section 3.9) to determine the relevant subsets of records to be searched.

## 3.8.2.4.4. CATEGORY DEFINITION:

- RC0 refers to the Refusal Code 00.
- RC1 refers to all Refusal Codes that have been designated as Type 1 Serious RC 1, i.e., the most serious, excluding 00.
- RC2 refers to all Refusal Codes that have been designated as Type 2 Serious RC, i.e., serious but less serious than RC0 and RC1.
- RC3 refers to all Refusal Codes that have been designated as Type 1 Non-Serious RC. These codes are less serious than the RC0, RC1 and RC2 codes.
- RC4 refers to Refusal Codes that have been designated as
  Type 2 Non-Serious. These codes are the least serious codes,
  less serious than the RC0, RC1, RC2 and RC3 codes.

# 3.8.3. Purpose

It has long been desirable to make more granular distinctions among the Refusal Codes. For many years, DOS has maintained a distinction between serious and non-serious codes; these different categories were correlated with different YOB search ranges. However, a mechanism for making greater distinctions will provide greater flexibility in delimiting the set to be retrieved during the first stage of record analysis. The introduction of five refusal code levels also provides the opportunity to correlate more year-of-birth ranges to the refusal code levels.

#### 3.8.4. Function

The RCL provides information needed for the evaluation of record proximity in the Arabic filtering process and contributes to the delimitation of database records retrieved through the RL/YOB Data Store.

# 3.9. YEAR-OF-BIRTH RANGE DATA STORE DECOMPOSITION

#### 3.9.1. Identification

This data store is known as the Year-of-Birth Range Data Store (YR).

#### 3.9.2. **Type**

- 3.9.2.1. It is recommended that the YR be a parameter file, which can be accessed by the client so YOB ranges can be set. Alternatively, it could be represented as a system parameter whose value(s) are set in an .ini file.
- 3.9.2.2. The YR will define the YOB ranges that will be associated with a Refusal Level (see Section 3.8).
- 3.9.2.3. This data store has the following format:

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48

Figure 26: Format: Year-of-Birth Range Data Store (YR)

Figure 20. Tormat		Town Dovar	VALUE	DATA DEFINITION
DATA FIELD	DATA TYPE	FIELD SIZE	VALUE	exact date of birth
YOB0	integer	1		exact year, inverted month and day
YOBI	character	1	A	exact year, inverted mental
YOB2	character	1	B	exact year of out
	integer	2	199	narrow year of birth range
YOB3		1 2	199	standard year of birth range
YOB4	integer	<del></del>	199	wide year of birth range
YOB5	integer	+ <del>-</del>	199	unlimited year of birth range
YOB6	integer		1	

the same

# 3.9.2.3.1. Definitions

- 3.9.2.3.2. DATA FIELD: YOB# is the Year-of-Birth Range category whose value indicates the year-of-birth range to be searched. The year-of-birth VALUE indicates the search range, that is, the number of years on either side of a given year-of-birth to be searched. For example, if the input year is 1962 and YOB3 range is 4, the search will cover a range of nine years, 1958-1966. The range includes the full year, so all of 1958 and all of 1966.
  - 3.9.2.3.2.1. There are seven YOB# categories, YOB0, YOB1, YOB2, YOB3, YOB 4, YOB5, YOB6.
    - YOB0 is a single integer that refers to an exact month, day, year of birth. If YOB0 is specified, the system must be able to match the month, day and year of the Date of Birth of an input record and a database record.
    - YOB1 is a single character (A) that refers to an exact year-of-birth with the month and day inverted.
      - If YOB1 is specified, the system must be able to match the year of Date of Birth and an inverted month and day (DEC 03 → MAR 12) of the input record and the database record.
      - YOB1 will be relevant to the Arabic Filter and Sorter, but may not function as a search parameter since the value would be subsumed in YOB2.
    - YOB2 is a single character (B) that refers to an exact year-of-birth. If YOB2 is specified, the system must be able to match the year of the Date of Birth of an input record and a database record.
    - YOB3 is a one- or two-place integer (1...99) that refers to a narrow year-of-birth range. Narrow yearof-birth range is usually defined as 1 year (for a search ránge of 3 years).

- YOB4 is one- or two-place integer (1...99) that refers to a standard year-of-birth range. Standard year-of-birth range is usually defined as 3 years (for a search range of 7 years).
- YOB5 is a one- or two-place integer (1...99) that refers to a wide year-of-birth range. Wide year-ofbirth range is usually defined as 5 years (for a search range of 11 years).
- YOB6 is a one- or two-place integer (1...99) that refers to an unlimited or extremely wide year-of-birth range. Unlimited year-of-birth range would be set sufficiently high to include all (or all desired) years-of-birth in the database (e.g., 50).

#### 3.9.3. Purpose

This YR provides a greater granularity in the year-of-birth range and, therefore, greater flexibility in delimiting the set to be retrieved during the first stage of record analysis. The correlation of five refusal code levels to different year-of-birth ranges will help to delimit the number of records to be searched and to define the more valuable set of records.

#### 3.9.4. Function

- 3.9.4.1. The YR permits greater granularity in the Date-of-Birth types related to the system.
- 3.9.4.2. The YR will be accessed by the Refusal Code Level/YOB Range Data Store, which will limit the retrieval range in the Arabic Search Engine.
- 3.9.4.3. The YR will contribute to the Arabic Filter and Sorter to contribute information to the composite score.

# 3.10. REFUSAL CODE LEVEL / YOB RANGE DATA STORE MODULE DECOMPOSITION

#### 3.10.1. Identification

This data store is known as the Refusal Code Level/YOB Range Data Store (RLYOB).

# 3.10.2. Type

- 3.10.2.1. The RLYOB is a matrix that merges the values in the Refusal Code Level (RCL) Data Store and the Year-of-Birth Range (YR) Data Store.
- 3.10.2.2. For each Refusal Level (RL), a Year-of-Birth (YOB) Range is specified.
  - 3.10.2.2.1. Only one YOB Range for each RL is permitted.
  - 3.10.2.2.2. The same YOB Range may apply to more than one RL.

# 3.10.2.3. The RLYOB has the following format:

Figure 27: Format: Refusal Level/Year-of-Birth Range Data Store (RLYOB)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
RL#	character	3	RL04	RL0, RL1, RL2, RL3, RL4
YOB#	character	4	YOB06	YOB0, YOB1, YOB2, YOB3, YOB4, YOB5, YOB6

Figure 28: Example: RLYOB Data Store

RL#	YOB#
RL0	YOB5
RL1	™. YOB4
RL2	YOB3
RL3	YOB3
RL4	YOB2

- 3.10.2.4. Definitions:
- 3.10.2.5. RL#: is a character string that indicates the Refusal Level of the Refusal Code.
- 3.10.2.6. YOB#: is a character string that indicates the Date-of-Birth Range Category of the comparands.

#### 3.10.3. Purpose

Retrieval of records from the database should be delimited by a relationship between the Refusal Code Level and the Year-of-Birth Range. It will restrict the number of records to be reviewed.

#### 3.10.4. Function

The RLYOB is a resource for the Arabic Search Engine to delimit the records retrieved from the database.

## 3.11. COUNTRY-OF-BIRTH PROXIMITY DATA STORE DECOMPOSITION

### 3.11.1. Identification

This data store is known as the Country-of-Birth Proximity Data Store (COBPROX).

#### 3.11.2. Type

- 3.11.2.1. The COBPROX is a matrix whose cells contain a decimal that reflects the degree of relationship between the country represented on the x-axis and the country represented on the y-axis.
- 3.11.2.2. The COBPROX has the following format:

Figure 29: Format: COBPROX Data Store

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
COB#1	character	4	alphabetics	COB Code
COB#2	character	4	alphabetics	COB Code
COBVAL	decimal	4	0.001.00	Various

Figure 30: Example: Piece of COBPROX Data Store

COB#1	COB#2	COBVAL
AGS	AGS	1.00
AGS	ALG	0.05
AGS	MORO	0.05
AGS	SARB	0.05
AGS	SYR	0.05
ALG	ALG	1.00
ALG	MORO	0.85
ALG	SARB	0.75
ALG	SYR	0.75
MORO	MORO	1.00
MORO	SARB	0.75
MORO	SYR	0.75
SARB	SARB	100
SARB	SYR	. 0.75
SYR	SYR	1.00

#### 3.11.2.3. Definitions:

- 3.11.2.3.1. COB#1: is the 4-character COB Code of one of the comparands.
- 3.11.2.3.2. COB#2: is the 4-character COB Code of one of the comparands.
- 3.11.2.3.3. COBVAL: is the decimal value assigned through the ACOB (and other COB Category Data Stores).

# 3.11.3. Purpose

The COBPROX Data Store provides information on the relative value of the COBs in two comparands. This value can serve to limit the COBs that are accessed for retrieval.

#### 3.11.4. Function

The COBPROX is populated by the ACOB and any other partition-specific Country-of-Birth Category Data Stores. The COBPROX provides COB relationship information.

# 3.12. ARABIC COUNTRY-OF-BIRTH CATEGORY DATA STORE DECOMPOSTION

#### 3.12.1. Identification

This data store is known as the Arabic Country-of-Birth Category Data Store (ACOB).

#### 3.12.2. Type

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This ACOB is a data store that will be serve as the source of information for the COBPROX Data Store, supplying the COBVAL, and will provide the COB Category (COBCAT) necessary for the Arabic Filter and Sorter.

Figure 31: Format: Arabic Country-of-Birth Category Data Store (ACOB)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
COB#1	characters	4	alphabetics	COB Code
COB#1	characters	4	alphabetics	COB Code
COBCAT	characters	5	alphanumberics	COB1COB99
COBVAL	decimal	4	0.001.00	Variouş

#### 3.12.3. Definitions

- 3:12.3.1. COB#1: is the 4-character COB Code of one of the comparands.
- 3.12.3.2. COB#2: is the 4-character COB Code of one of the comparands.
- 3.12.3.3. COBCAT: is the category assigned to the relationship of two COBs.
  - 3.12.3.3.1. Categories might include such relationships as Exact, State, Geographic Region, Dialect Region.
  - 3.12.3.3.2. All relationships are adjustable.
- 3.12.4. COBVAL: is the decimal value that will be assigned to a particular COB relationship; this value will be used to determine the COBs that will be permitted in the retrieval process.
- 3.12.5. Example COB Categories might be:

COB1: Exact represents an exact match of the COBs: ALG/ALG; the COBPROXVAL would be 1.00.

COB2: Western Dialect Region represents the set of COBs that are in close geographic proximity and share naming conventions: ALG/MORO. The score would be something less than that applied to an exact match but nonetheless high: 0.85.

COB3: Arabic Partition represents all COBs within the Arabic partition. The value assigned would be less than that for COB2: 0.75.

COB4: All refers to all COBs and is assigned a value that will allow the search of all COBs; it would be the lowest decimal value used.

# 3.12. ARABIC COUNTRY-OF-BIRTH CATEGORY DATA STORE DECOMPOSTION

#### 3.12.1. Identification

This data store is known as the Arabic Country-of-Birth Category Data Store (ACOB).

#### 3.12.2. Type

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This ACOB is a data store that will be serve as the source of information for the COBPROX Data Store, supplying the COBVAL, and will provide the COB Category (COBCAT) necessary for the Arabic Filter and Sorter.

Figure 31: Format: Arabic Country-of-Birth Category Data Store (ACOB)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
COB#1	characters	4	alphabetics	COB Code
COB#1	characters	4	alphabetics	COB Code
COBCAT	characters	5	alphanumberics	COB1COB99
COBVAL	decimal	4	0.001.00	Various

#### 3.12.3. Definitions

- 3.12.3.1. COB#1: is the 4-character COB Code of one of the comparands.
- 3.12.3.2. COB#2: is the 4-character COB Code of one of the comparands.
- 3.12.3.3. COBCAT: is the category assigned to the relationship of two COBs.
  - 3.12.3.3.1. Categories might include such relationships as Exact, State, Geographic Region, Dialect Region.
  - 3.12.3.3.2. All relationships are adjustable.
- 3.12.4. COBVAL: is the decimal value that will be assigned to a particular COB relationship; this value will be used to determine the COBs that will be permitted in the retrieval process.
- 3.12.5. Example COB Categories might be:

COB1: Exact represents an exact match of the COBs:

ALG/ALG; the COBPROXVAL would be 1.00.

COB2: Western Dialect Region represents the set of COBs that are in close geographic proximity and share naming conventions: ALG/MORO. The score would be something less than that applied to an exact match but nonetheless high: 0.85.

COB3: Arabic Partition represents all COBs within the Arabic partition. The value assigned would be less than that for COB2: 0.75.

COB4: All refers to all COBs and is assigned a value that will allow the search of all COBs; it would be the lowest decimal value used.

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# 3.12. ARABIC COUNTRY-OF-BIRTH CATEGORY DATA STORE DECOMPOSTION

#### 3.12.1. Identification

This data store is known as the Arabic Country-of-Birth Category Data Store (ACOB).

#### 3.12.2. Type

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This ACOB is a data store that will be serve as the source of information for the COBPROX Data Store, supplying the COBVAL, and will provide the COB Category (COBCAT) necessary for the Arabic Filter and Sorter.

Figure 31: Format: Arabic Country-of-Birth Category Data Store (ACOB)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
COB#1	characters	4	alphabetics	COB Code
COB#1	characters	4	alphabetics	COB Code
COBCAT	characters	5	alphanumberics	COB1COB99
COBVAL	decimal	4	0.001.00	Various

#### 3.12.3. Definitions

- 3.12.3.1. COB#1: is the 4-character COB Code of one of the comparands.
- 3.12.3.2. COB#2: is the 4-character COB Code of one of the comparands.
- 3.12.3.3. COBCAT: is the category assigned to the relationship of two COBs.
  - 3.12.3.3.1. Categories might include such relationships as Exact, State, Geographic Region, Dialect Region.
  - 3.12.3.3.2. All relationships are adjustable.
- 3.12.4. COBVAL: is the decimal value that will be assigned to a particular COB relationship; this value will be used to determine the COBs that will be permitted in the retrieval process.
- 3.12.5. Example COB Categories might be:

COB1: Exact represents an exact match of the COBs: ALG/ALG: the COBPROXVAL would be 1.00.

COB2: Western Dialect Region represents the set of COBs that are in close geographic proximity and share naming conventions: ALG/MORO. The score would be something less than that applied to an exact match but nonetheless high: 0.85.

COB3: Arabic Partition represents all COBs within the Arabic partition. The value assigned would be less than that for COB2: 0.75.

COB4: All refers to all COBs and is assigned a value that will allow the search of all COBs; it would be the lowest decimal value used.

Figure 32: Example: Piece of ACOB (Values for example only.)

COB#1	COB#2	COBCAT	COBVAL
ALG	ALG	COBI	1.00
ALG	MORO	COB2	0.85
ALG	SARB	COB3	0.75
ALG	SYR	COB3	0.75
MORO	MORO	COBI	1.00
MORO	SARB	COB3	0.75
MORO	SYR	COB3	0.75
'SARB	SARB	COBI	1.00
SARB	SYR	COB3	0.75
SYR ***	SYR	COBI	1.00

# 3.12.6. Purpose

Pre-defined COB category relationships will provide a definition of the values that appear in the COBPROX Data Store.

# 3.12.7. Function

These COB categories will provide information about COB relationships that will contribute to determination of the Composite Score in the Arabic Filter and Sorter.

# SOFTWARE DESIGN DESCRIPTION FOR THE HISPANIC NAME SEARCH ALGORITHM

(HNA - E)

# TABLE OF CONTENTS

	1
1. INTRODUCTION	l
1.1 D	4
1.2 Coops	2
1.2 Definitions and Apparatus	٠
2. PROCESS FLOW	5
3. MODULE DECOMPOSITION	٠
3. MODULE DECOMPOSITION	5
DECOMPOSITION	11
3.2. HISPANIC NAME PREPROCESSOR MODULE DECOMPOSITION	12
3.3. NAME LENGTH DETERMINER MODULE DECOMPOSITION	12
3.4. HISPANIC SURNAME SEGMENTER MODULE DECOMPOSITION	12
3.5. HISPANIC TITLE/AFFIX/QUALIFIER (TAQ) PROCESSOR MODULE	14
DECOMPOSITION	17
3.6. HISPANIC SEGMENT POSTTIONER MODULE DECOMPOSITION 3.7. HISPANIC NAME FORMATTER MODULE DECOMPOSITION	17
3.7. HISPANIC NAME FORMATTER MODULE DECOMPOSITION	19
3.8. SEGMENT POSITION IDENTIFIER MODULE DECOMPOSITION	19
3.9. HISPANIC GENDER IDENTIFIER MODULE DECOMPTION	21
3.10. FREQUENCY PATH DIRECTOR MODULE DESCRIPTION	24
3.11. HIGH FREQUENCY PROCESSOR MODULE DECOMPOSITION	31
3.12. LOW FREQUENCY PROCESSOR MODULE DECOMPOSITION	45
3.13. HISPANIC SEARCH ENGINE MODULE DECOMPOSITION	51
3.14. HISPANIC FILTER AND SORTER MODULE DECOMPOSITION	66
4. DATA DECOMPOSITION	67
4.1. DATA	67
· · · · · · · · · · · · · · · · · · ·	00
A DAMA STORES	00
4.4. HISPANIC TITLE/AFFIX/QUALIFIER DATA STORE DECOMPOSITION	68
4.4. HISPANIC TITLE AFFIX QUALITIES OF THE OFFICE OFFICE OFFICE OFFICE OFFICE OFFICE O	N 70
4.6. HIGH FREQUENCY SURNAME VARIANT DATA STORE	
DECOMPOSITION	7:
DECOMPOSITION	74
4.7. HIGH FREQUENCY DECISION MATRIX DATA STORE	7
4.8. HISPANIC GIVEN NAME I IFE DATA STORE DECOM COTTO	

NA-E anguage Analysis Systems, Inc.

4.9. HIGH FREQUENCY GIVEN NAME VARIANT DATA STORE	
DECOMPOSITION	79
4.10. LOW FREQUENCY SURNAME TYPE DATA STORE DECOMPOSITION.	80
4.10. LOW FREQUENCY SURNAME THE DATA STORE DECOME OFFICE	82
4.11. HISPANIC CHARACTER DATA STORE	02
4.12. TAQ FILTER DATA STORE DECOMPOSITION	ده.
4.13 HISPANIC PARAMETER DATA STORE DECOMPOSITION	. 84
4.14. REFUSAL CODE CATEGORY DATA STORE DECOMPOSITION	. 86
4.15. YEAR-OF-BIRTH RANGE DATA STORE DECOMPOSITION	. 88
4.16. REFUSAL CODE LEVEL / YOB RANGE DATA STORE MODULE	
4.16. REFUSAL CODE LEVEL / TOB RANGE DATA STORE MODULE	91
DECOMPOSITION	ຸກາ
4.17. COUNTRY-OF-BIRTH PROXIMITY DATA STORE	. 92
4.18. HISPANIC COUNTRY-OF-BIRTH CATEGORY DATA STORE	
DECOMPOSTION	. 93
DECOMI COLLO	

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# SOFTWARE DESIGN DESCRIPTION FOR THE HISPANIC NAME SEARCH ALGORITHM

(HNA - E)

### 1. INTRODUCTION

#### 1.1. Purpose

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The current VLDB consists of about 5 million refusal records. The outlook envisions significant growth of the database in the near future and continued growth as more and more data are shared with other Government agencies. Currently, between 45% and 50% of the records have a country of birth from the Hispanic world, about 2.5 million records. These proportions are unlikely to change as the database expands.

Additionally, the character of Hispanic personal names is such that they are both dense and complex. Dense means that there are a relatively few individual surnames that account for the vast majority of surname occurrences. That is, the 500 most frequently occurring distinct surnames account for over 70% of all distinct surnames in the database. The surnames of well over 50% of the records contain only high frequency surnames. Another 25-30% contain at least one of the high frequency surnames. Complex means that Hispanic surnames generally contain more than 1 surname, the first of which is the family name, the second a matronymic (FLORES GOMEZ). Approximately 75% of the surnames from the Hispanic partition contain 2 surname stems (not including affixes like DE, DE LOS). Another 23% have only 1 surname stem. (The remaining records have 3-6 stems.)

The frequency of the names, the high portion of the VLDB and the syntactic variation that can occur in these names (inversion of the names, deletion of a name) argue for special handling of the Hispanic name search process.

The most important aspect of this specialized Hispanic name search algorithm is an efficient High Frequency Name Processor. Retrieval of fewer records for evaluation, yet ones that reflect some variation, is the goal of the High Frequency Processor.

The High Frequency Processor (HFP) of the HNA-E system targets the efficient processing of the most frequently occurring records in the Hispanic portion of the database. Early attempts at developing a processor that would handle high frequency Hispanic names had several major weaknesses.

- The earlier processors did not adequately address the characteristics of Hispanic names. In the name of performance, they did not allow for any variation in high frequency names.
- There was only one access method to the high frequency processor, which eliminated the processing of names similar to the high frequency names by the High Frequency Processor.
- Strict, often unmotivated, limitations were placed on the high frequency retrieval process. Little to no spelling or syntactic variation was permitted.
- The number of records retrieved was often extremely high, which resulted in a significant amount of post-processing.

All of these issues have been addressed in the HNA-E design. The HFP will be primarily list-based but the lists are empirically developed. It will identify and store relevant information about names, variants and their degree of proximity and will apply record similarity criteria before retrieval.

Low frequency Hispanic names, on the other hand, carry more information value because they are less usual. However, even low frequency names occur with sufficient frequency to challenge the system; the Hispanic database in general is very large. Preprocessing low frequency names will, therefore, also help reduce the number of records retrieved by limiting the search criteria.

#### 1.2. Scope

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The HNA-E system is intended to provide special and unique handling for names identified as Hispanic by the Automatic Name Classifier (ANC-E). It addresses the problem of highly frequent names to maximize retrieval potential and minimize the impact on performance and handles less frequently occurring names differently to accommodate the greater information content in these names. It also allows for broad variation in low frequency names and identifies potentially relevant records before database retrieval.

The input into the HNA-E system will be the output of the Advanced Name Classifier (ANC-E). ANC-E will determine if a name is Hispanic and therefore will undergo special processing by the Hispanic Name Algorithm (HNA-E). The design description of the ANC-E is contained as Attachment A in LAS Linguistic Memorandum CT970044 (May 30, 1997).

It became clear during the research for this design that the data stores that would be seminal to this system were very large. The Low Frequency Surname Type Data Store, for example, has over 90,000 records in it. Well over 37,000 of these names occur one time in the database; many of these are obvious misspellings or truncations of names. That is, the character strings do not occur in Spanish: RRODRIGUEZ, for example. It is suggested that a program of data stewardship be initiated to increase the efficiency of the system and reduce the storage needed for deviant material. One method of introducing data stewardship at this juncture would be to introduce Base

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Records for the database records with errors and make the current database record of the new Base Record.

1.3. Definitions and Acronyms

ANC-E	Advanced Name Classifier for CLASS-E
DELETE	The name segment is completely disregarded in the remainder of the name search process
	and contributes minimal information to the record evaluation process; do not remove the
	segment from the record
DISREGARD	The name segment is disregarded in the remainder of the name search process but
	contributes to the evaluation of the name in the record evaluation process; do not remove
	the segment from the record
DI_KEY	Digraph Key (low frequency name types)
DI_VAL	Digraph Value (two-place decimal indicating digraph relation of two comparands.
F	Female
FNU	First Name Unknown
FPD	Frequency Path Director
FTI	Frequency Type Identifier
GN	Given Name
GNDR	Name Gender
GNTHR	Given Name Threshold (filter qualification)
GN_INIT	Given Name Initial Key
GN_VAL	Final Given Name Value
HCD	Hispanic Character Data Store
HDM	Hispanic Decision Matrix
HFGN KEY	High Frequency Given Name Key (SET_ID of the GN_TYPE)
HFGV	High Frequency Given Name Variant Data Store
HFGN_VAR	High Frequency Given Name Variant Key
HF	High Frequency
HFP	High Frequency Processor
HFS	Hispanic Filter and Sorter
HFSN_KEY	High Frequency Surname Key (SET_ID of the HFSN_TYPE)
HFSN VAR	High Frequency Surname Variant Key (ID_NO of the HFSN_VAR)
HFST	High Frequency Surname Type Data Store
HFSV	High Frequency Surname Variant Data Store
HGI	Hispanic Gender Identifier
HGT	Hispanic General Administration of the Hispanic Given Name Type Data Store
HNA-E	Hispanic Name Search Algorithm for CLASS-E
HNF	Hispanic Name Formatter
HNP	Hispanic Name Preprocessor
	Hispanic Given Name Type Data Store
HNT	Hispanic Parameter Data Store
HPD	Hispanic Regularization Rule Base
HR	Hispanic Rule Engine
HRE	
HSE	Hispanic Search Engine Hispanic Segment Positioner
HSP	Hispanic Segment Positioner
HSS	Hispanic Surname Segmenter
HTD	Hispanic TAQ Data Store
HTP .	Hispanic TAQ Processor
ID_NO	Identification Number for Segments in Data Stores
INITGN	Given Name Initial Parameter Value

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### PROCESS FLOW

A Hispanic name is pre-processed and prepared for key generation. Prefixes are removed, certain name segments are moved, record gender is determined and other name characteristics are collected.

The processor to which a name is submitted is dependent on the frequency of the surname, high frequency or low frequency. There are multiple entries into the High Frequency Processor, which means that low frequency names that are related to high frequency names can also be treated as high frequency names.

The underlying principle behind the handling of high frequency names is that they retrieve a specified set of variants, all of which have pre-determined digraph values associated with them. This places the processing burden on adding records to the system and reduces the burden at the time of the query. Record retrieval criteria have been defined according to the values of the names and their relative positions in the query string, a query with high frequency names will, therefore, retrieve a smaller set of relevant names. The goal is to retrieve an adequate range of names as rapidly as possible.

Variants of low frequency names will be identified before retrieval based on matching digraph keys. The system will then retrieve exact matches on the set of low frequency names that pass a low frequency threshold.

#### MODULE DECOMPOSITION

3.1. HISPANIC NAME SEARCH ALGORITHM FOR CLASS-E MODULE DECOMPOSITION

#### 3.1.1. Identification

This program is known as the Hispanic Name Search Algorithm for CLASS-E (HNA-E)

#### 3.1.2. Type

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This program is a subprogram of the CLASS-E system and will process Hispanic names for both queries and record adds.

#### 3.1.3. Purpose

HNA-E will process input names identified as Hispanic by the ANC-E using techniques that are appropriate for Hispanic names. No names with Last Name Unknown (LNU) will be processed by HNA-E.

#### 3.1.4. Function

The Hispanic Name Search Algorithm for CLASS-E (HNA-E) consists of three program modules:

- the Hispanic Name Preprocessor (HNP),
- the Hispanic Search Engine (HSE), and
- the Hispanic Filter and Sorter (HFS).
- 3.1.4.1. The HNP will manipulate an input name to generate search keys, generate additional query forms or alias record adds, calculate record gender, collect information about the input name and its name segments and determine the frequency path to which a name will be submitted for processing.
  - 3.1.4.1.1. The HNP will pass an input name to one of two processing paths:
    - the High Frequency Name Processor (HFP) or
    - the Low Frequency Name Processor (LFP).
  - 3.1.4.1.2. The HNP will generate a set of record criteria and search keys for retrieval of records from the database.

- 3.1.4.2. The HSE will build the retrieval keys, extract record information relevant to the retrieval and retrieve database records according to the keys and criteria identified.
- 3.1.4.3. The HFS will evaluate the database records and will prepare an ordered set of records for return to the user.
  - 3.1.4.3.1. The HFS will qualify records based on filtering criteria and parameters.
  - 3.1.4.3.2. The HFS will sort the qualifying database records into an ordered list with the names most closely proximate to the query name at the top.

## 3.1.5. Subordinates

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HNA-E consists of 3 major programming modules: (See Pages 7-10 for graphic representations of the processing flow of these modules.)

- Hispanic Name Preprocessor (HNP),
- Hispanic Search Engine (HSE), and
- Hispanic Filter and Sorter (HFS).

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# 3.2. HISPANIC NAME PREPROCESSOR MODULE DECOMPOSITION

#### 3.2.1. Identification

This module is known as the Hispanic Name Preprocessor (HNP).

#### 3.2.2. Type

The HNP is a subprogram of the HNA-E program that accepts input from the Advanced Name Classifier for CLASS-E (ANC-E) and prepares it for handling by the Hispanic Search Engine (HSE). (See Section 3.13.)

#### 3.2.3. Purpose

Hispanic names account for almost 50% of the VLDB name records. In addition to the volume of occurrence, there are many names that occur very frequently. The format of Hispanic names contributes further obstacles to name searching: the surname generally consists of two names and the given names generally consists of two names. The most highly frequently occurring prefix in the VLDB is also Hispanic: DE. The frequency, density and the nature of the name argue for preparing the name in whatever way(s) are necessary to expedite the retrieval process. That is the function of the HNP.

#### 3.2.4. Function

- 3.2.4.1.The HNP will prepare a name identified as Hispanic by the ANC-E for the HSE by
  - identifying name segments and determining their disposition,
  - manipulating the name segments to generate additional query formats
  - determining name length and record gender,
  - specifying the frequency character of each name segment and
  - generating search keys.
- 3.2.4.2. Because of the significant amount of information that is to be generated and collected about the name through the HNP, it is strongly recommended that the name be treated as an object that "knows" what sorts of information it needs. Such an object will provide a mechanism for following the acquisition of information as the object passes through the system. Much of that information will be collected and loaded during the HNP stage.

#### 3.2.5. Subordinates

The HNP has ten subordinate functions:

- Name Length Determiner (NLD)
- Hispanic Surname Segmenter (HSS)
- Hispanic TAQ Processor (HTP)
- Hispanic Segment Positioner (HSP)
- Segment Position Identifier (SPI)
- Hispanic Name Formatter (HNF)
- Hispanic Gender Identifier (HGI)

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- Frequency Path Director (FPD)
- High Frequency Name Processor (HFP)
- Low Frequency Name Processor (LFP)

# 3.3. NAME LENGTH DETERMINER MODULE DECOMPOSITION

### 3.3.1. Identification

This function is known as the Name Length Determiner (NLD).

#### 3:3.2. Type

The NLD is a function that accepts as input a surname (SN) segment and stores the surname length. The length will be used by the Hispanic Surname Segmenter (Section 3.4).

### 3.3.3. Purpose .

Name segment length will provide information that will be used by the Hispanic Surname Segmenter to attempt to divide surnames over a specific length into component segments.

# 3.3.4. Function

- 3.3.4.1. The NLD will accept as input each SN segment.
  - 3.3.4.1.1. A segment is a string of characters surrounded by white space.
  - 3.3.4.1.2. The NLD will count the number of characters in SN segment (not including surrounding blanks).
  - 3.3.4.1.3. The NLD will store the length count associated with each SN segment.

# 3.3.5. Subordinates

None.

# 3.4. HISPANIC SURNAME SEGMENTER MODULE DECOMPOSITION

# 3.4.1. Identification

This function is known as the Hispanic Surname Segmenter (HSS).

#### 3.4.2. Type

The HSS attempts to divide surnames over a specified length into component segments. The HSS is a function that must follow the NLD and precede the Hispanic TAQ Processor (Section 3.5).

### 3.4.3. Purpose

Hispanic names often have many segments and these segments may be quite long. Field lengths of fixed size may not be able to accommodate the number of name segments that occur. Data entry operators often attempt to reduce the name length by conjoining name segments. Conjoined segments have an especially negative impact on the surname. The access point into the database

is through the surname and conjoined name segments generally make the component segments inaccessible to processing. Separating conjoined surnames would, therefore, improve the search process.

#### 3.4.4. Function

- 3.4.4.1. The HSS will separate conjoined HF SN segments from a surname segment of nine characters or more in length.
  - 3.4.4.1.1. The HSS will generate additional query records for the separated SN segment and tag the items separated.
  - 3.4.4.1.2. The HSS will generate alias record adds for the separated SN name segments.
- 3.4.4.2. The HSS will access the High Frequency Surname Type Data Store (HFST).
  - 3.4.4.2.1. Phase 1: The HSS will begin with the leftmost character of the query/add SN segment and attempt to identify a HFSN\_TYPE within the input SN string.
  - 3.4.4.2.2. The HSS will choose the longest HFSN\_TYPE that it can identify, separate that string from the input string and proceed to Phase 2.
  - 3.4.4.2.3. Phase 2: The HSS will begin with the rightmost character of the query/add SN segment and attempt to identify a HFSN\_TYPE (in reverse order) within the remaining input string (after any HFSN\_TYPE has been removed during Phase 1).
  - 3.4.4.2.4. The HSS will choose the longest HFSN\_TYPE that it can identify and separate that string from the remaining input string.
  - 3.4.4.2.5. Any residual segment will be retained as is.
  - 3.4.4.2.6. If no HFSN\_TYPE can be identified in either Phase, no action will be taken.
  - 3.4.4.2.7. An alias (or additional query) will be generated for the divided string.

Figure 1: Example: Hispanic Surname Segmenter

INPUT NAME	HFSN TYPE	PHASE 1	PHASE 2	OUTPUT
GARCIAGOMEZ	GARCIA GOMEZ	GARCIA	GOMEZ	GARCIA GOMEZ
PEREZDELOPEZ	PEREZ LOPEZ	PEREZ	DELOPEZ	PEREZ DE LOPEZ
BOMEZDEPEREZ	PEREZ	BOMEZDE	PEREZ	BOMEZDE PEREZ
RAMIREZDELAPAZ	RAMIREZ PAZ	RAMIREZ	DELAPAZ	RAMIREZ DELA PAZ

# 3.4.5. Subordinates

None.

3.5. HISPANIC TITLE/AFFIX/QUALIFIER (TAQ) PROCESSOR MODULE DECOMPOSITION

#### 3.5.1. Identification

This module will be known as the Hispanic Title/Affix/Qualifier Processor (HTP).

#### ·3.5.2. Type

411

The HTP is a process that accepts a full Surname (SN) or Given Name (GN), accesses the Hispanic TAQ Data Store and reduces name fields with multiple segments to their name stems.

#### 3.5.3. Purpose

Hispanic names frequently contain peripheral name elements, such as DE, DE LA, DEL, SAN. Matching on these segments is not generally useful; the name segments with information value are the name stems. For example, GARCIA is the more valuable segment in the string DE GARCIA, as is ANGELES in DE LOS ANGELES. Removal of or disregard for the peripheral name elements allows more emphasis to be placed on the name stems, thus improving the search process.

#### 3.5.4. Function

- 3.5.4.1. The HTP will access the Hispanic TAQ Data Store (HTD) to identify TAQ segments: titles (e.g., SR., MR.), affixes (e.g., DE) or qualifiers (e.g., PH.D., HIJO).
  - 3.5.4.1.1. The HTD will contain information about the disposition of the TAQ.
  - 3.5.4.1.2. The HTD will contain information about the type of TAQ (TAQ\_TYPE): Title, Prefix, Infix, Suffix, Qualifier.
- 3.5.4.2. The HTP will scan all SN segments or all GN segments for any TAQ segments.
  - 3.5.4.2.1. The HTP will begin with the leftmost character of the SN or GN field and attempt to identify a TAQ segment among the SN segments and among the GN segments. (The TAQ segment will be surrounded by white space.)
  - 3.5.4.2.2. If the HTP identifies a segment, it will tag the segment with the ID\_NO and disposition, as indicated in the HTD.
  - 3.5.4.2.3. If the following segment is also a TAQ segment, it will tag the segment with the ID\_NO and disposition, as indicated in the HTD.

- 3.5.4.2.4. This will continue until all *consecutive* TAQ segments have been tagged.
- 3.5.4.2.5. When the HTP encounters a following segment that is not a TAQ segment, it will treat that segment as a stem.
  - 3.5.4.2.5.1. Each TAQ segment identified up to that point will be given the TAQ\_TYPE P (prefix) and each will be associated and stored with the following stem.
- 3.5.4.2.6. The HTP will move to the next segment following the stem and will repeat the TAQ identification process.
  - 3.5.4.2.6.1. The HTP will tag all TAQ segments with the ID\_NO and disposition.
  - 3.5.4.2.6.2. When the HTP encounters a stem, it will tag each TAQ segment (not yet associated with a stem) with the TAQ\_TYPE P and will associate and store each TAQ segment with the following stem.
- 3.5.4.2.7. If HTP encounters a TAQ segment or segments that has no following stem, it will access the HTD to determine if the TAQ type is a Suffix (S).
  - 3.5.4.2.7.1. If the TAQ has a TAQ\_TYPE S, the TAQ will be associated and stored with the preceding stem.
  - 3.5.4.2.7.2. The preceding stem may already have prefixal TAQs.
  - 3.5.4.2.7.3. If the TAQ type is not equal to S, the TAQ will be tagged a Stranded Prefix.
- 3.5.4.3. The HTP will process any TAQ segments identified according to the treatment indicated in the HTD.
- 3.5.4.4. Treatment options include DELETE, DISREGARD and REMOVE.
  - 3.5.4.4.1. **DELETE** means that the segment is completely disregarded in the remainder of the name search process and contributes marginal information to the filtering process. (N.B. The segment is not deleted from the record.)
  - 3.5.4.4.2. **DISREGARD** means that the segment is disregarded in the remainder of the name search process but contributes to the evaluation of the name in the filtering processes.
  - 3.5.4.4.3. **REMOVE** means that a segment that is conjoined to the name stem is removed from that stem. It is then submitted to additional handling, either DELETE or DISREGARD.
    - 3.5.4.4.3.1. The HTP will begin with the leftmost character in the input stem segment (after free-standing TAQs have

- been removed) and will attempt to identify all TAQ segments that have been marked for removal (REMOVE).
- 3.5.4.4.3.2. The HTP will begin with the longest TAQ segment and attempt to remove that; it will then proceed to shorter segments.
- 3.5.4.4.3.3. If the segment that is to remain after TAQ removal is two characters or fewer, the HTP will not remove the
- 3.5.4.4.3.4. If the TAQ segment is identified and the residual stem is of sufficient length, it is separated from the stem.
- 3.5.4.4.3.5. The HTP assigns and stores the ID\_NO of the removed TAQ.
- 3.5.4.4.3.6. The HTP then submits the removed TAQ to the treatment indicated (DELETE or DISREGARD) in the HTD and tags and stores the TAQ with that treatment indicator.

Figure 2: Example: TAQ REMOVE Process

INPUT STRING     TAY REMOVE     DE CORDOBA       DECORDOBA     DE     DELOS ANGELES       DELOSANGELES     DE     DE ARING	Figure 2: Example: TAC	REMOVE FIOCESS	OUTPUT
DECORDOBA  DECORDOBA  DELOS DELOS ANGELES  DELOS ARING	TAIDUT STRING	TAQ REMOVE	
DELOS ANGELES  DELOS ANGELES  DE DE ARING			
DELOSANGELES DE ARING	DECORDOBA		DELOS ANGELES
1 1)+	DELOSANGELES		DE ARING
DEADING	DEARING	DE	MARIADE
1)1:		DE	,
MARIADE DEL DEL PILAR		DEL	DEL PILAR
DELPILAR	DELPILAR	1	

3.5.4.5. After all TAQ segments have been submitted to the appropriate process, the remaining segments will be considered SN and GN stems.

Figure 3: Example: TAQ Processing

Figure 3: Ex	ample: TAQ Processing	OUTPUT SN:
	TALIS AND STEMS	
DE	TAQ: DE (ID_NO, REMOVE, DISREGARD)	
LA	TAQ: LA (ID_NO, REMOVE, DISREGARD)	CRUZ
CRUZ	STEM: CRUZ TAQ: DE (ID_NO, REMOVE, DISREGARD)	
DE	TAQ: DE (ID_NO, REMOVE, DISKES	BARRIOS
BARRIOS	STEM: BARRIOS TAQ: SAN (ID_NO, DISREGARD, Stranded Prefix)	TJ
SAN	TAQ: SAN (ID_NO, DISKEGARD, O	

# 3.5.5. Subordinates

None.

HNA-E Language Analysis Systems, Inc. 16

# 3.6. HISPANIC SEGMENT POSITIONER MODULE DECOMPOSITION

#### 3.6.1. Identification

This function is known as the Hispanic Segment Positioner (HSP).

3.6.2. **Type** 

The HSP is a function that moves a high frequency (HF) surname (SN) found in the given name (GN) field into the SN field.

3.6.3. Purpose

Surnames that occur in the GN field deprive the match process of relevant SN information. Moving a SN segment that occurs in the GN field to the SN field will benefit the search process. (The SN segment is moved to the rightmost position to retain the value assigned to the resident SN segment(s).)

## 3.6.4. Function

- 3.6.4.1. If more than one GN segment (stem) occurs in the GN field, the HSP will determine if the final (rightmost) segment in the GN string is a HF SN
- 3.6.4.2. The HSP will move the segment to the SN field.
  - 3.6.4.2.1. If more than one GN segment occurs in the GN field, the HSP will access the High Frequency Surname Type Data Store (HFST) to determine if the rightmost GN segment is a HFSN\_TYPE.
  - 3.6.4.2.2. If the segment is a HFSN\_TYPE, the HSP will move the segment into the rightmost position of the SN field.
- 3.6.4.3. The process applies to one name segment only and is not iterative.

Figure 4: Example: Hispanic Segment Positioner (HSP)

Figure 4. Example. Trispanie degitient : dettet (					
INPUT NAME	HFSN_TYPE	OUTPUT FORMAT			
CASTRO, MARIA LUZ GOMEZ	GOMEZ	CASTRO GOMEZ, MARIA LUZ			
BARRIOS LUNA, JUAN PEREZ	PEREZ	BARRIOS LUNA PEREZ, JUAN			
LOPES ARRIAGA, CARLOS VITRAL		LOPES ARRIAGA, CARLOS VITRAL			
LOI LO ARRESTOTE, CHIEDOU		<u></u>			

- 3.6.4.4. An additional query record is generated with the moved segment; the original record is not changed.
- 3.6.4.5. An alias record add is generated with the moved segment; the original record is not changed.

#### 3.6.5. Subordinates

None.

# 3.7. HISPANIC NAME FORMATTER MODULE DECOMPOSITION

# 3.7.1. Identification

This module is known as the Hispanic Name Formatter (HNF).

#### 3.7.2. Type

- 3.7.2.1. The HNF is a process that generates additional name formats for input records that have more than two surname stems.
- 3.7.2.2. The HNF will follow the HSS, HTP, and HSP.
- 3.7.2.3. The generated formats will serve as the name format for HF name processing and for comparison in the filtering and sorting process.

#### 3.7.3. Purpose

The HNF will limit the number of segments that can occur in the surname field to two in order to maximize the efficient processing of the input name.

# 3.7.4. Function

- 3.7.5. The HNF will generate additional alias record adds and queries for surnames that contain more than two SN stems.
  - 3.7.5.1. The HNF will accept input strings with any number of SN segments (stems).
  - 3.7.5.2. When more than two SN segments are present, the HNF will generate additional name formats with a limit of two SN segments.
    - 3.7.5.2.1. The HNF will begin with the leftmost SN segment and generate dual-SN formats with each additional SN segment.
    - 3.7.5.2.2. The HNF will move to the second SN segment and generate dual-SN formats with each other SN segment that have not yet been generated.
    - 3.7.5.2.3. The relative order of all segments will be maintained.
  - 3.7.5.3. All generated formats will be stored with the record add.
  - 3.7.5.4. All generated formats will be additional queries.

Figure 5: Example: Hispanic Name Formatter (HNF)

INPUT SURNAME	GARCIA	LUNA	BUSTOS	ARRIAGA
HNF DUAL-SN FORMATS	GARCIA	LUNA		<u> </u>
	GARCIA		BUSTOS	<u>l,</u>
	GARCIA			ARRIAGA
		LUNA	BUSTOS	
		LUNA	,	ARRIAGA
			BUSTOS	ARRIAGA

# 3.7.6. Subordinates

None.

# 3.8. SEGMENT POSITION IDENTIFIER MODULE DECOMPOSITION

# 3.8.1. Identification

This module is known as the Segment Position Identifier (SPI).

#### ·3.8.2. Type

The SPI is a function that identifies the relative position of each of the SN and GN stems. The SPI must follow the HTP, HSP and HNF. Segment position information will be accessed by the High Frequency Processor (HFP) and the Hispanic Filter and Sorter (HFS).

# 3.8.3. Purpose

Hispanic names generally contain more than one SN and more than one GN.

The value of each of these name stems is different. In a SN, the leftmost stem is the family name; other SN stems are differentiators. The family name carries more value in the SN. In a GN, the leftmost name stem generally indicates gender so is a valuable indicator. Names that are in- and out-of position are therefore of differing relevance. Position information can contribute to the selection and evaluation of relevant records.

#### 3.8.4. Function

- 3.8.4.1. The SPI will operate on any SN or GN except where dual-SN formats have been generated.
  - 3.8.4.1.1. Where dual-SN formats have been created, the SPI will accept only those formats.
  - 3.8.4.1.2. The SPI will accept any number of GN segments.
- 3.8.4.2. The SPI will specify the position in the name field (SN or GN fields) of each name segment.
- 3.8.4.3. The SPI will begin with the leftmost segment and assign Position 1, proceeding to the next segment and assign Position 2, and so forth.
- 3.8.4.4. Position information will be generated for and stored with each SN segment.
- 3.8.4.5. Position information will be generated for and stored with each GN segment.

#### 3.8.5. Subordinates

None.

# 3.9. HISPANIC GENDER IDENTIFIER MODULE DECOMPOSITION

#### 3.9.1. Identification

This function is known as the Hispanic Gender Identifier (HGI).

### 3.9.2. Type

This is a function that associates a gender value with a **record**; it will be accessed by the Hispanic Decision Matrix (HDM) and the Hispanic Filter and Sorter (HFS).

### 3.9.3. Purpose

It is usually possible to predict the gender of a Hispanic name based on the gender marker of the leftmost given name segment. Because crossed-gender names are of little value in the visa adjudication process, lowering the value of a record whose gender does not match that of a query would improve the name matching process.

Predicting gender based on one source of gender, however, may result in elimination of records that differ by one character only. More than one source of gender information can provide a means of validating the gender assignment. This will be the record gender. Record gender will reduce the chance of qualifying or disqualifying a record based on the gender of a single name segment, which could be misspelled or ambiguous with respect to gender.

## 3.9.4. Function

- 3.9.4.1. The HGI will derive a gender that will be associated with a *record* and not a Given Name stem alone.
- 3.9.4.2. A record gender value may be Male (M), Female (F), or Unknown/Ambiguous (U) Gender.
  - 3.9.4.2.1. The HGI will derive the record gender from the GN gender associated with each GN segment and the gender provided by the user during the data entry process.
    - 3.9.4.2.1.1. The HGI will access the Hispanic Given Name Type Data Store (HGT) to determine the gender associated with each GN segment.
      - 3.9.4.2.1.1.1. If the name is present in the HGT, the gender indicated will be associated with the GN segment.
      - 3.9.4.2.1.1.2. If the name is not present in the HGT, the record gender will be marked as Unknown (U). (This would occur for a query with a name never before submitted to the system.)
    - 3.9.4.2.1.2. The applicant gender is determined at the time of application and must be entered, captured and stored by the system.

- 3.9.4.2.2. The HGI will verify that all gender indicators agree: the gender associated with each GN segment and the applicant gender received at the time of application.
  - 3.9.4.2.2.1. To mark the record gender as M or F, the HGI requires gender validation from a *minimum* of two sources.
  - 3.9.4.2.2.2. All sources of gender information (whether two or more) must match for gender to be marked as M or F.
    - 3.9.4.2.2.1. If the gender indicators match, the match value will become the record gender.
    - 3.9.4.2.2.2.2. If the gender indicators do not match, gender is marked as U.

Figure 6: Example: Record Gender Assignment

GIVEN NAME	HGT GNDR	INPUT GENDER	RECORD GENDER
1) MARIA	F	F	F
LUZ	F		
2) JOSE	M	M	M
ANTONIO	M		
3) CARLOS	M	M	Ŭ
(DE LA) CRUZ	U		
4) BERNARDO	M	M	M
5) CAMEN (misspelling)	(not in HGT)	F	Ŭ
MARIA	F		

#### 3.9.5. Subordinates

None.

# 3.10. FREQUENCY PATH DIRECTOR MODULE DESCRIPTION

#### 3.10.1. Identification

This module is known as the Frequency Path Director (FPD).

# 3.10.2. Type

- 3.10.2.1. The FPD directs a record to the High Frequency Processor or Low Frequency Processor depending on the presence or absence of HF *surnames* in the string.
- 3.10.2.2. The FPD will access the following data stores:
- High Frequency Surname Type Data Store (HFST)
- Hispanic Character Data Store (HCD)

## 3.10.3. Purpose

Many Hispanic names occur with such high frequency that they would benefit from special processing. The system must determine which the high

frequency surnames are and direct records with high frequency surnames to the proper handler.

#### 3.10.4. Function

- 3.10.4.1. The FPD will accept any SN format, except where dual-SN formats have been generated by the Hispanic Name Formatter (HNF).
  - 3.10.4.1.1. The FPD will operate on the dual-SN formats where they have been generated.
- 3.10.4.2. The FPD will identify, process and assign keys to SN initials.
- 3.10.4.3. The FPD will identify and tag each SN stem as HF or LF.
- 3.10.4.4. The FPD will assign HFSN\_KEYs, where appropriate.
- 3.10.4.5. The FPD will direct the record to the HF Processor or LF Processor depending on the frequency tags of the SN segments.
- 3.10.4.6. The frequency-identification process will repeat until the frequency value of all SN segments has been identified.
- 3.10.4.7. Surname Initials
- 3.10.4.8. Record Adds
- 3.10.4.9. The FPD will generate a SN\_INIT Key for the initial character of each SN segment (The SN segment may be an initial).
  - 3.10.4.9.1. The FPD will access the Hispanic Character Data Store (HCD) to identify the SN\_INIT Key.
  - 3.10.4.9.2. The FPD will find the initial character in the CHAR list.
  - 3.10.4.9.3. The FPD will assign the SN\_INIT Key to the character.
  - 3.10.4.9.4. The SN\_INIT Key will be the SET\_ID for all occurrences of the character.
  - 3.10.4.9.5. The FPD will store the SN\_INIT Key with the SN segment of the record.

# 3.10.4.10. Query

- 3.10.4.11. The FPD will identify single characters that occur in the SN field; any segment that has a name length of 1 (as specified by the Name Length Determiner (NLD)) is an initial.
- 3.10.4.12. The FPD will access the Hispanic Character Data Store (HCD) to determine the SN\_INIT Key(s) to assign to the segment.
  - 3.10.4.12.1. The FPD will find each instance of the character in the CHAR\_VAR list.
  - 3.10.4.12.2. The FPD will assign SN\_INIT Key(s) to the SN initial.

- 3.10.4.12.3. The SN\_INIT KEY is the SET\_ID associated with each instance of the initial.
- 3.10.4.12.4. The SN initial may have multiple SN\_INIT Keys.
- 3.10.4.13. The FPD will ignore the SN\_INIT Keys when determining the frequency path assignment of a record; the assignment will be based on the frequency of the other SN segment.

## 3.10.4.14. High Frequency Surnames

- 3.10.4.15. The FPD will access the High Frequency Surname Type Data Store (HFST).
  - 3.10.4.16. If a SN segment matches exactly a HFSN\_TYPE in the HFST, the segment will be given the HFSN\_KEY associated with the HFSN\_TYPE.
    - 3.10.4.16.1. Record Add/Query: The HFSN\_KEY will be the SET\_ID associated with the HFSN\_TYPE in the HFST.
    - 3.10.4.16.2. **Record Add**: A digraph value (DI\_VAL) of 1.00 will be assigned to and stored with the segment that matches a HFSN\_TYPE exactly.
    - 3.10.4.16.3. The HFSN\_KEY will represent a set of name segments that have qualified as digraph variants of the HFSN\_TYPE. (See 3.12.4.38 for information on how the variants are assigned to the same set.)
  - 3.10.4.17. The FPD will direct records that contain all HFSN\_KEYs to the High Frequency Processor (HFP).

Figure 7: Example: Qualification for High Frequency Processor

INPUT NAME:	FIELD	HFSN_KEY	DI_VAL
GARCIA LOPEZ, ANTONIO JESUS			
GARCIA	SN	0001	1.00
LOPEZ	SN	0004	1.00

Figure 8: Resource: Piece of High Frequency Surname Type Data Store (HFST)

ID_NO	HFSN_TYPE	SET_ID
0001	GARCIA	0001
0002	RODRIGUEZ	0002
0003	HERNANDEZ	0003
0004	LOPEZ	0004
0005	MARTINEZ	0005
0006	GONZALEZ	0006
0007	PEREZ	0007
0008	SANCHEZ	0008
0009	RAMIREZ	0009
0010	GOMEZ	.0010
0011		0011

3.10.4.18. The FPD will direct all records that do *not* contain all HFSN\_KEYs to the Low Frequency Processor (LFP).

# 3.10.5. Subordinates

None.

3.11. HIGH FREQUENCY PROCESSOR MODULE DECOMPOSITION

#### 3.11.1. Identification

This module is known as the High Frequency Processor (HFP).

## 3.11.2. Type

- 3.11.2.1. The HFP is a program module that
  - will process records with all HFSN\_KEYs, HFSN\_VAR Keys, SN\_INIT Keys and mixed HF and LF Keys;
  - · will generate Given Name Keys; and
  - will access the Hispanic Decision Matrix Data Store (HDM) to identify retrieval criteria for the HF records.
- 3.11.2.2. Multiple entry points into the HFP will be supported: through the Frequency Path Director and the Low Frequency Processor (LFP).

## 3.11.3. Purpose

Earlier attempts to develop a HF handler for Hispanic names have been limited to processing of records that contain only HF names; little to no variation was permitted. HNA-E will support variation in the processing of HF names by allowing multiple entry points into the HFP.

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#### 3.11.4. Function

- 3.11.4.1. The HFP will accept names directed to the processor by the Frequency Path Director (FPD) and by the LFP.
- 3.11.4.2. The records accepted will contain all HFSN\_KEYs and/or HFSN\_VAR Keys, SN\_INIT Keys, and mixed HFSN\_KEY/HFSN\_VAR and DI\_KEYs.
- 3.11.4.3. All SN\_INIT Keys passed to the HFP will be treated as segment Keys and will undergo the same criteria identification as other segments.
- 3.11.4.4. If all segments of the SN Field have been given HFSN\_KEYs and/or HFSN\_VAR Keys and related DI\_VALs, the HFP will begin processing the GN segments.

# 3.11.4.5. Processing the Given Name Segments

- 3.11.4.6. If the GN segment is First Name Unknown (FNU), no GN processing will take place.
- 3.11.4.7. High Frequency Given Name Segment Keys

#### 3.11.4.8. Record Adds

- 3.11.4.9. The HFP will access the Hispanic Given Name Variant Data Store (HGNV) to determine if the GN segments are HF GN segments.
  - 3.11.4.9.1. If the GN segment matches one or more variants in the HGNV, the HFP will assign the HFGN\_KEY to the GN segment.
  - 3.11.4.9.2. The HFGN\_KEY is(are) the SET\_ID(s) associated with the variant.
  - 3.11.4.9.3. The HFP will associate the appropriate DI\_VAL with the SET\_ID and GN segment.
  - 3.11.4.9.4. The HFP will store the SET\_ID(s) and their DI\_VAL with the GN segment.
  - 3.11.4.9.5. The HFGN\_KEY ensures that the system will retrieve variants of a HF segment when the HF segment is queried.

#### 3.11.4.10. Query

- 3.11.4.11. The HFP will access the Hispanic Given Name Type Data Store (HGT).
  - 3.11.4.11.1. If a GN segment matches exactly a GN\_TYPE name segment in the HGT and HI\_FREQ = 1 (is True) (that is, the segment is a HF GN\_TYPE segment), the HFP will assign to the GN segment the HFGN\_KEY associated with the GN\_TYPE.

- 3.11.4.11.2. The HFGN\_KEY will be the SET\_ID associated with the HF GN\_TYPE.
- 3.11.4.12. High Frequency Given Name Initial Keys
- 3.11.4.13. The HFP will create one or more GN\_INIT Keys for each HF GN segment.
- 3.11.4.14. The GN\_INIT Key will be the initial key for each GN segment, including initials.
  - 3.11.4.14.1. Record Add

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- 3.11.4.14.2. The HFP will identify the initial character of each GN segment.
- 3.11.4.14.3. The HFP will access the Hispanic Character Data Store (HCD) and will find all occurrences of the character in the CHAR-VAR list.
- 3.11.4.14.4. The HFP will assign the GN\_INIT Key(s) to each GN initial.
  - 3.11.4.14.4.1. The GN\_INIT Key will be the SET\_ID(s) associated with the GN initial (CHAR\_VAR).
  - 3.11.4.14.4.2. The GN segment may have multiple GN\_INIT Keys.
  - 3.11.4.14.4.3. The GN\_INIT Key will permit retrieval of multiple initials for a GN initial.
  - 3.11.4.14.4.4. The HFP will store the GN\_INIT Key(s) for each GN segment initial with the record.
- 3.11.4.14.5. Query
- 3.11.4.14.6. The HFP will access the HCD and find the initial in the CHAR list.
- 3.11.4.14.7. The HFP will identify the GN\_INIT Key for each GN segment initial.
- 3.11.4.15. If the GN segment is not a variant in the HGNV, the HFP will tag the name as LF.
- 3.11.4.16. Low Frequency Given Name Segment Keys
- 3.11.4.17. For each LF GN segment, the HFP will attempt to determine if the segment is a potential variant of a HF GN\_TYPE and will create one or more GN\_INIT Keys for record adds and queries.
- 3.11.4.18. Record Add
- 3.11.4.19. If the LF GN is *not* in the HGNV Data Store, the HFP will determine if the segment is a potential variant of a HFGN\_TYPE. (This

would apply to LF GN segments that are being submitted to the system for the first time.)

- 3.11.4.19.1. If the HFP determines that the HF GN segment is a variant of a HFGN\_TYPE, the LFP will append the segment to the HFGV Data Store.
- 3.11.4.19.2. The HFP will access the Hispanic Given Name Type Data Store (HGT) to determine if the LF GN segment is a digraph variant of one or more of the HF GN\_TYPEs. (That is, the LF GN segment is a digraph variant of the GN\_TYPE whose HF Value is True (1)).
- 3.11.4.19.3. The LFP will perform a digraph evaluation of the LF GN and each HF GN\_TYPE.
- 3.11.4.19.4. The digraph value is determined in the following way:
  - 3.11.4.19.4.1. The digraphs are identified for each segment.
  - 3.11.4.19.4.2. Each pair of alphabetic characters is identified: CARA → CA/AR/RA
  - 3.11.4.19.4.3. A digraph is also formed of the initial boundary (#) and the first alphabetic character: CARA → #C.
  - 3.11.4.19.4.4. A digraph is also formed of the final alphabetic character and the final boundary (#): CARA → A#.
  - 3.11.4.19.4.5. The number of shared digraphs is calculated.
    - 3.11.4.19.4.5.1. A digraph may match one digraph only.
  - 3.11.4.19.4.6. The number of shared digraphs is multiplied by 2 and divided by the total number of digraphs in Comparand #1 added to the total number of digraphs in Comparand #2.
    - 3.11.4.19.4.6.1. The formula is:

2 \* d / a + b, where d = the total number of shared digraphs; where a = the total number of digraphs in Comparand #1; and where b = the total number of digraphs in Comparand #2.

3.11.4.19.4.7. The result is the Digraph Value (DI\_VAL) for the two Comparands.

Figure 9: Example: Digraph Calculation

COMPARANDS	DIGRAPHS	SHARED DIGRAPHS	DI_VAL
COMPARAND#1: CARA	#C CA AR RA A# (5 total digraphs = a)	#C CA AR A#	2*d/a+b= 8/12
COMPARAND #2: CARINA	#C CA AR RI IN NA A# (7 total digraphs = b)	= 4 (d)	0.67

- 3.11.4.19.4.8. This process is performed for each of pair of Comparands.
- 3.11.4.19.5. To qualify for addition to the HFGV as a variant of one or more HFGN\_TYPEs, the digraph value must pass a threshold, the High Frequency Given Name Variant Threshold (HFGV Threshold).
  - 3.11.4.19.5.1. The HFP will access the Hispanic Parameter Data Store (HPD) (Section 4.13) to determine the HFGV Threshold that the digraph value must pass for the LF GN to be appended to the HFGV Data Store.
  - 3.11.4.19.5.2. If the LF GN segment qualifies as digraph variant of one or more HF GN\_TYPEs, the HFP
    - will append the LF GN to the HFGN\_TYPEs to which
      it is related by entering the name into the HFGN\_VAR
      list in the HFGV Data Store;
    - will assign the next available ID\_NO to the newly added HFGN\_VAR;
    - will assign the SET\_ID to the newly added HFGN\_VAR that corresponds to the SET\_ID of the HFGN\_TYPE with which the new HFGN\_VAR is associated;
    - will enter the digraph value into DI\_VAL; and
    - will store with the LF GN segment in the record the ID\_NO(s) of the HFGN\_VAR for each entry, the SET\_ID of each HFGN\_TYPE that is the parent of the HFGN\_VAR, and the digraph value associated with each entry.
- 3.11.4.20. Whether or not the LF segment is a variant of a HFGN\_TYPE, the HFP will generate one or more GN\_INIT Keys for the LF GN segment.
  - 3.11.4.20.1. The GN\_INIT Key will be the initial key for each GN segment, including segments that are initials.
  - 3.11.4.20.2. If the GN segment is FNU (First Name Unknown), no GN\_INIT Key will be generated.

28

3.11.4.20.3. Record Add

HNA-E Language Analysis Systems, Inc.

- 3.11.4.20.4. The HFP will identify the initial character of each GN segment.
- 3.11.4.20.5. The HFP will access the Hispanic Character Data Store (HCD) and will find all occurrences of the character in the CHAR-VAR list.
- 3.11.4.20.6. The HFP will assign the GN\_INIT Key(s) to each GN initial.
  - 3.11.4.20.6.1. The GN\_INIT Key will be the SET\_ID(s) associated with the GN initial (CHAR\_VAR).
  - 3.11.4.20.6.2. The GN segment may have multiple GN\_INIT Keys.
  - 3.11.4.20.6.3. The GN\_INIT Key will permit retrieval of multiple initials for a GN initial.
  - 3.11.4.20.6.4. The HFP will store the GN\_INIT Key(s) for each GN segment initial with the record.
- 3.11.4.20.7. Query

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- 3.11.4.20.8. The HFP will access the HCD and find the initial in the CHAR list.
- 3.11.4.20.9. The HFP will identify the GN\_INIT Key for each GN segment initial.
- 3.11.4.20.10. The GN\_INIT Key will be the SET\_ID associated with the CHAR.

Figure 10: Example: HFGN\_KEYs and GN\_INIT Keys (Query)

	- B						
INPUT GN	HF?	HFGN_KEY	GN_INIT				
			KEYS				
MARIO	T	020	078 (M)				
MICHAEL	F		078 (M)				
YSABEL	F		036 (Y, I)				
ZUSANA	F		002 (Z, S)				

Figure 11: Example: HFGN\_KEYs and GN\_INIT Keys (Record Add)

Tigute II. Example: In Civ_IEE Is and Civ_III III							
INPUT GN	HF?	HF VARIANT?	HFGN_TYPE	HFGN_KEY	GN_INIT KEYs		
MARIO	T		MARIO	020	078 (M)		
MICHAEL	F	F			078 (M)		
YSABEL	F	T	ISABEL	203	036 (Y, I)		
ZUSANA	F	T	SUSANA	436	002 (Z, S)		

- 3.11.4.21. The HFP will direct queries with all HF SN or mixed HF and LF SN (including SN\_INIT Keys) and any GN Keys (HFGN\_KEYs or GN\_INIT Keys) or FNU to the Hispanic Decision Matrix (HDM) to determine the record retrieval criteria.
  - 3.11.4.21.1. Criteria for database retrieval include name content (whether the names are the same or different), the position of the name segments, the YOB range, the Refusal Code Level, Record Gender and additional restrictions based on the GN.

# 3.11.4.22. Hispanic Decision Matrix

- 3.11.4.23. The HFP will access the portion of the HDM that represents the number of HF SN segments in the query name, either one HF SN or two HF SNs
- 3.11.4.24. The HFP will identify and generate the set of SN formats possible for the number of SN segments in the query (one or two).
  - 3.11.4.24.1. The SN formats indicate
    - · position of segments,
    - number of segments, and
    - other segments permitted.
- 3.11.4.25. The HFP will identify the retrieval criteria in the HDM associated with each SN format.
  - 3.11.4.25.1. The retrieval criteria include
    - Year-of-Birth Range
    - Refusal Level and
    - Record Gender
- 3.11.4.26. GN Keys will be carried forward with the retrieval criteria.
- 3.11.4.27. The HFP will send to the Hispanic Search Engine (HSE) the query format(s), all retrieval criteria associated with each query format and all SN Keys and all GN Keys generated for the query.

Figure 12: Example: Hispanic Decision Matrix (Values for example only)

	Single	-Segme	nt SN					Two-Seg	ment SN	1		
OUERY SN FORMAT	A	Α	Α		AB	AB	AB	AB	AB	AB	AB	AB
DATABASE SN FORMATS	A	AB	BA		AB	BA	A	В	AC	CA	CB	BC
YR	5	5	2	l	5	4	4	2	2	0	0	0
RL	4	4	3		4	4	4	1	1	0	0	0
RGNDR	MFU	MFU	MFU		MFU	MFU	MFU	MFU	FU	MFU	MFU	MFU.

## 3.11.5. Subordinates

None.

# 3.12. LOW FREQUENCY PROCESSOR MODULE DECOMPOSITION

### 3.12.1. Identification

This module is known as the Low Frequency Processor (LFP).

### 3.12.2. Type

- 3.12.2.1. The LFP is a program module that will process names that contain SN segments identified by the FPD as Low Frequency SN segments (i.e., not found in the HFST Data Stores by the FPD).
- 3.12.2.2. The LFP will access the
  - High Frequency Surname Variant Data Store (HFSV) and
  - Low Frequency Surname Type Data Store (LFST).

#### 3.12.3. Purpose

The LFP will process name segments that are identified as LF SN segments by the FPD. The LFP will determine 1) whether or not the LF segment is a variant of one or more HF SN and 2) whether or not the LF segment has variants among the LF segments listed in the Low Frequency Surname Type Data Store (LFST). The result of these two processes will be a list of segments to use as exact matches for retrieval.

### 3.12.4. Function

# 3.12.4.1. General

- 3.12.4.2. The LFP will accept from the FPD any record with a SN segment that has been tagged as a LF SN.
  - 3.12.4.2.1. The LFP will process records that contain only LF segments *and* all records that contain mixed HF and LF segments.
  - 3.12.4.2.2. The LFP will process records that contain one LF segment and SN\_INIT Keys.
    - 3.12.4.2.2.1. Low frequency processing will be limited to the LF segment.
    - 3.12.4.2.2.2. The SN\_INIT Keys will contribute to the building of LF retrieval keys.
  - 3.12.4.2.3. With mixed HF and LF SN, the LFP will process only the LF SN segment. (The HF segment will have been assigned a HFSN\_KEY by the FPD).
- 3.12.4.3. All LF segments in records that are sent to the LFP will be analyzed for both HF affiliations and LF variants.

### 3.12.4.4. The LFP will attempt

to relate each LF SN segment to one or more HFSN\_TYPEs,

- to identify other LF SN segments related to the input LF SN segment(s), and
- to append LF SN segments to the HFSV and LFST that have not been previously submitted to the system to the HFSV and LFST.
- 3.12.4.5. The LFP will direct a query in which all LF SN segment(s) have been related to HFSN\_TYPEs to the High Frequency Processor (HFP) (see Section 3.11) for generation of GN Keys and submission to the Hispanic Decision Matrix.
  - 3.12.4.5.1. The record may have the format HFSN\_KEY (or SN\_INIT Key) + HFSN\_VAR Key, where the second key relates a LF SN segment to a HFSN\_TYPE.
  - 3.12.4.5.2. The record may have the format HFSN\_VAR Key + HFSN\_VAR Key, where both segments are keys relating a LF SN segment to a HFSN\_TYPE.
  - 3.12.4.5.3. The record may have the format HFSN\_VAR Key, where the only segment is a key relating a LF SN segment to a HFSN\_TYPE.
- 3.12.4.6. The LFP will direct a query record in which all LF SN segments have been related to other LFSN\_TYPEs directly to the Hispanic Search Engine. (SN\_INIT Keys may be present.)
- 3.12.4.7. The LFP will perform the following processes:
  - Access the HFSV Data Store to determine if the LF name segment is variant of a HFSN\_TYPE.
  - Assign HFSN\_VAR Key(s), as appropriate.
  - Generate LF\_KEYs for LF SN variants identified in the LFS Data Store
  - Perform a digraph comparison on the HFST Data Store to determine if a LF SN not in the HFSV Data Store is a digraph variant of a HFSN\_TYPE segment.
- 3.12.4.8. The goal of the LFP, for a query with LF SN segments, is to develop a set of specific names related to the LF SN that will be used as keys for record retrieval.
- 3.12.4.9. Identifying Related High Frequency Surnames
- 3.12.4.10. The LFP will access the HFSV Data Store to determine if each LF SN segment in the input name is a variant of HFSN\_TYPE.
  - 3.12.4.10.1. The LFP will attempt to find all occurrences of the LF SN segment in the HFSN\_VAR list.
  - 3.12.4.10.2. Record Add

- 3.12.4.10.3. If the segment is found in the HFSN\_VAR list, the LFP will assign one or more HFSN\_KEYs and HFSN\_VAR Keys to the LF SN.
  - 3.12.4.10.3.1. The keys will be
    - the HFSN\_KEY: the SET\_ID associated with the HFSN\_TYPE that is the parent of the HFSN\_VAR and
    - the HFSN\_VAR Key: the ID\_NO of the HFSN\_VAR.
  - 3.12.4.10.3.2. The digraph value associated with the HFSN\_TYPE and HFSN\_VAR pair will be retrieved and stored with the HFSN\_KEY and HFSN\_VAR Key as the DI\_VAL.
  - 3.12.4.10.3.3. The LFP will store the HFSN\_KEY, HFSN\_VAR Key and the associated digraph value with the record
    - 3.12.4.10.3.3.1. For example, if GARCA is the LF SN and is a variant of the HFSN\_TYPE GARCIA, then GARCA will be given the SET\_ID associated with the HFSN\_TYPE GARCIA (0001) and the ID\_NO that uniquely identifies GARCA (000137).
    - 3.12.4.10.3.3.2. The associated digraph value (0.77) will be stored with the LF SN GARCA as the DI\_VAL of 0001 and 000137.
  - 3.12.4.10.3.4. There may be multiple HFSN\_KEYs and HFSN\_VAR Keys associated with a single LF SN segment.

Figure 13: Example: Associating a LF SN Segment with HFSN\_TYPE in a Record Add

QUERY SURNAME: PEREZ BOMEZ	HF SN?	HFSN_TYPE	Н	DI_VAL	
101120 201120			HFSN_KEY	HFSN_VAR KEY	
PEREZ	T	PEREZ	0007		1.00
BOMEZ	F	GOMEZ	0010	016978	0.67

Figure 14: Piece of HFST Data Store

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	TIPON MUDE	SET_ID
ID_NO	HFSN_TYPE	
0001	GARCIA	0001
0002	RODRIGUEZ	0002
0003	HERNANDEZ	0003
0004	LOPEZ	0004
0005	MARTINEZ	0005
0006	GONZALEZ	0006
0007	PEREZ	0007
0008	SANCHEZ	0008
0009	RAMIREZ	0009
0010	GOMEZ	0010
0011		0011

with the sail

Figure 15: Piece of HFSV Data Store

ID_NO	HFSN_VAR	SET_ID	DI_VAL
032711	PEREZ	007	1.00
032712	PERES	007	0.67
032713	PEREZA	007	0.77
016976	GOMEZ	010	1.00
016977	GOMES	010	0.67
016978	BOMEZ	010	0.67

3.12.4.10.4. Query

- 3.12.4.10.5. The LFP will attempt to associate the LF SN with one or more HFSN\_TYPEs.
  - 3.12.4.10.5.1. The LFP will access the HFSV and determine if the LF SN is a variant of a HFSN\_TYPE.
  - 3.12.4.10.5.2. If the LF SN is found in the HFSN\_VAR list of the HFSV table, the LFP will assign a HFSN\_VAR Key to the LF SN segment.
    - 3.12.4.10.5.2.1. The HFSN\_VAR Key will be the ID\_NO associated with the HFSN\_VAR (and not the SET\_ID that is associated with the HFSN\_TYPE).
      - 3.12.4.10.5.2.1.1. The LF segment will be associated with the HF segment but with no other name segments in the same HFSN\_TYPE class.
      - 3.12.4.10.5.2.1.2. That is, the variants associated with the HF segment are *not* related to one another through this process.

3.12.4.10.5.3. A LF SN may be a variant of multiple HFSN\_TYPEs and may therefore receive multiple HFGN\_VAR Keys.

3.12.4.10.6. If, by virtue of this process, all LF SN segments in a query are set equal to HFSN\_VAR Keys, the LFP will direct the query record to the HFP (see Section 3.11) for generation of Given Name Keys, submission to the High Frequency Decision Matrix (HDM) and identification of retrieval criteria.

Figure 16: Example: Associating a LF SN Segment with HFSN\_TYPE in a Query

QUERY SURNAME: PEREZ BOMEZ	HF SN?	HFSN_TYPE			
TERES SOMES	-		HFSN_KEY	HFSN_VAR KEY	
PEREZ	T	PEREZ	0007		
BOMEZ	F	GOMEZ		016978	

Figure 17: Piece of HFST Data Store

Figure 17. Fiece of This Data Store						
HFSN_TYPE	SET_ID					
GARCIA	0001					
RODRIGUEZ	0002					
HERNANDEZ	0003					
LOPEZ	0004					
MARTINEZ	0005					
GONZALEZ	0006					
PEREZ	0007					
SANCHEZ	0008					
RAMIREZ	0009					
GOMEZ	0010					
	0011					
	HFSN_TYPE GARCIA RODRIGUEZ HERNANDEZ LOPEZ MARTINEZ GONZALEZ PEREZ SANCHEZ RAMIREZ					

Figure 18: Piece of HFSV Data Store

ID NO	HFSN_VAR	SET_ID	DI_VALUE
032711	PEREZ	007	1.00
032712	PERES	007	0.67
032713	PEREZA	007	0.77
016976	GOMEZ	010	1.00
016977	GOMES	010	0.67
016978	BOMEZ	010	0.67

3.12.4.10.7. The LFP will direct all queries and record adds to a LF analysis whether or not the LF SN segment was identified as a variant of a HFSN\_TYPE.

- 3.12.4.11. Identifying Related Low Frequency Surnames
- 3.12.4.12. General
- 3.12.4.13. All records with one or more LF SN segments will undergo LF analysis by the LFP.
- 3.12.4.14. For record adds, the LFP will assign an ID\_NO that will be stored with the record.
- 3.12.4.15. The LFP will generate LFDIKEYs for each LF SN segment in the query.
- 3.12.4.16. The LFP will use the LFDIKEYs to identify related LF SN segments.
- 3.12.4.17. Note that the LFP will not generate LF Keys for the GN portion of the input name.
- 3.12.4.18. LF SN Segment in LFST
- 3.12.4.19. The LFP will determine if the LF SN segment of the input record is in the Low Frequency Surname Type Data Store (LFST).
- 3.12.4.20. Record Add:
- 3.12.4.21. If the LF SN segment is a LFSN\_TYPE in the LFST, the LFP will assign to and store with the LF SN segment the ID\_NO associated with the LFSN\_TYPE.
- 3.12.4.22. Query:
- 3.12.4.23. If the LF SN segment is a LFSN\_TYPE in the LFST, the LFP will retrieve the (up to) 10 digraph keys (LFDIKEYs) that are associated with the name segment in the LFST.
- 3.12.4.24. The LFP will use the LFDIKEYs retrieved from the LFST and the LFDIKEYs stored with all LFSN\_TYPEs in the LFST Data to subset the LFST and to identify potential variants of the input LF SN segment.
- 3.12.4.25. Identifying LF Query Variants
- 3.12.4.26. Phase 1:
- 3.12.4.27. The LFP will subset the LFST Data Store.
- 3.12.4.28. The LFP will select those names from the LFST that share a predetermined set of LFDIKEYs.
  - 3.12.4.28.1. The LFP will determine the number of LFDIKEYs shared between each LFSN\_TYPE and the LF query SN segment.
  - 3.12.4.28.2. The LFP will determine the Shared Key Value based on the number of shared digraphs.
    - 3.12.4.28.2.1. The LFP will use the following formula to determine the Shared Key Value: multiply the number

of shared keys by two and divide by the total number of keys associated with each name:

2 \* [number of shared keys] / (total keys of Comparand #1 plus total keys of Comparand #2)

3.12.4.28.3. The LFP will select only those LFSN\_TYPEs whose Shared Key Value passes the LFDIKEY Threshold.

3.12.4.28.3.1. The LFP will access the Hispanic Parameter Data Store to identify the minimum matching requirement for the Shared Key Value, the LFDIKEY Threshold.

3.12.4.28.3.2. For a segment to qualify for further processing, the Shared Key Value must pass the LFDIKEY Threshold found in the Hispanic Parameter Data Store (HPD).

Figure 19: Example: Phase 1: LF Variants Related to a LF Query SN Segment; LFDIKEY Threshold = 0.40

•	ID_NO		LFDIKEYs	SHARED KEYS	PASS LFDIKEY THRESHOLD 0.40?
QUERY NAME #1		FLORENZAN	FL1/FL2/LO2/LO1/LO3/ OR3/OR2/OR4/RE4/RE3		
LFSN_TYPE	000189	FLORENZAN	FL1/FL2/LO2/LO1/LO3/ OR3/OR2/OR4/RE4/RE3	10 (All)	2*10/20 = 1.00 YES
LFSN_TYPE	000232	FLORESZ	FL1/FL2/LO2/LO1/LO3/ OR3/OR2/OR4/RE4/RE3	10 (All)	2*10/20 = 1.00 YES
LFSN_TYPE	000412	LORENZ	LO1 / LO2 / OR2 / OR1 / OR3 / RE3 / RE2 / RE4 / EN4 / EN3	5 (LO2 / OR2 / OR3 / RE3 / RE4)	2*5/20 = 0.50 YES
QUERY NAME #2		TOREAT	TO1/TO2/OR2/OR1/OR3/ RE3/RE2/RE4/EA4/EA3		
LFSN_TYPE	000714	TOREAT	TO1/TO2/OR2/OR1/OR3/ RE3/RE2/RE4/EA4/EA3	10 (All)	2*10/20 = 1.00 YES
LFSN_TYPE	000652	THORET	TH1 / TH 2 / HO2 / HO1 / HO3 / OR3 / OR2 / OR4 / RE4 / RE3	4 (OR2 / OR3 / RE3 / RE4)	2*4/20 = 0.40 YES
LFSN_TYPE	000776	TOERO	TO1/TO2/OE2/OE1/OE3/ ER3/ER2/ER4/RO4/RO3	2 (TO1 / TO2)	2*2/20 = 0.20 NO

#### 3.12.4.29. Phase 2:

- 3.12.4.30. The LFP will perform a digraph comparison of each LF query SN segment that passed the LFDIKEY Threshold with each LFSN\_TYPE.
- 3.12.4.31. The digraph comparison will identify the set of names to be retrieved from the database.
  - 3.12.4.31.1. See Section 3.11.4.19.4 for the digraph analysis function and formula.

- 3.12.4.31.2. The LFP will access the Hispanic Parameter Data Store to determine the LF\_DI Threshold.
- 3.12.4.31.3. For a segment to qualify for further processing, the digraph value must pass the LF\_DI Threshold found in the Hispanic Parameter Data Store.

Figure 20: Example: Digraph Filter of LFST Candidate SN Segments

LF QUERY SN: FLORENZAN	LFSN_TYPES PASSING LFDIKEY THRESHOLD	DIGRAPH SCORE	PASS LF_DI THRESHOLD: 0.57?
FLORENZAN	FLORENZAN	2*10/20 = 1.00	YES
FLORENZAN	FLORESZ	2*5/18 = 0.56	NO
FLORENZAN	LORENZ	2*5/17 = 0.59	YES

- 3.12.4.32. The LFP will assign a key (DI\_KEY) to each LFSN\_TYPE that passes the LF\_DI Threshold.
  - 3.12.4.32.1. The DI\_KEY will be the ID\_NO associated with the LFSN\_TYPE in the LFST.
  - 3.12.4.32.2. The DI\_KEY will contribute to the building of the retrieval key.
- 3.12.4.33. For a segment that passes the LF\_DI Threshold, the LFP will retain the digraph score derived from the digraph evaluation and associate it with the appropriate DI\_KEY.
- 3.12.4.34. Low Frequency Surname Segment Not in LFST
- 3.12.4.35. Add:
- 3.12.4.36. If the LF SN record add segment is not in the LFST, the LFP
  - will append the LF SN to the LFST as a LFSN\_TYPE and assign the next ID\_NO available;
  - will generate the LFDIKEYs for the new LFSN\_TYPE and will add them to the LFST with the LFSN\_TYPE;
  - will assign the ID\_NO to the LF SN segment of added record and
  - will determine if the LF SN is a variant of a HFSN\_TYPE and therefore should also be added to the HFSV Data Store.
- . 3.12.4.37. The LFP will append the LF SN segment and its LFDIKEYs to the LFST.
  - 3.12.4.37.1. The LFP will assign the next available ID\_NO to the newly entered LF SN (LFSN\_TYPE).
  - 3.12.4.37.2. The LFP will generate the LFDIKEYs to be associated with the LF SN segment (see 3.13.4.42).
  - 3.12.4.37.3. The up-to-10 keys will be added to the LFST along with the LFSN\_TYPE.

- 3.12.4.37.4. The LFP will assign the LFSN\_TYPE ID\_NO to the LF SN segment for storage with the record add.
- 3.12.4.38. The LFP will determine if a LF SN segment that was not identified as a HFSN\_VAR in the HFSV and that was not identified as a LFSN\_TYPE in the LFST is a potential variant of a HFSN\_TYPE.
  - 3.12.4.38.1. The LFP will access the High Frequency Surname Type Data Store (HFST) to determine if the LF SN segment is a digraph variant of one or more of the HFSN\_TYPEs.
    - 3.12.4.38.1.1. The LFP will perform a digraph evaluation of the LF SN and each HFSN\_TYPE. (See Section 3.11.4.19.4 for details of the procedure and formula for performing a digraph evaluation.)
    - 3.12.4.38.1.2. To qualify for addition to the HFSV as a variant of one or more HFSN\_TYPEs, the digraph value must pass a threshold, the High Frequency Surname Variant Threshold (HFSV Threshold).
    - 3.12.4.38.1.3. The LFP will access the Hispanic Parameter Data Store to determine the HFSV Threshold that the digraph value must pass for the LF SN to be appended to the HFSV Data Store.
  - 3.12.4.38.2. If the LF SN segment is determined to be a digraph variant of one or more HFSN\_TYPEs, the LFP
    - will append the LF SN to the HFSN\_TYPEs to which it is related by entering the name into the HFSN\_VAR list;
    - will assign an ID\_NO to the newly added HFSN\_VAR;
    - will assign the SET\_ID to the newly added HFSN\_VAR
       that corresponds to the SET\_ID of the HFSN\_TYPE with which the new HFSN\_VAR is associated;
    - will enter the digraph value into DI\_VAL; and
    - will store with the LF SN segment in the record add the ID\_NO of the HFSN\_VAR for each entry, the SET\_ID of each HFSN\_TYPE that is the parent of the HFSN\_VAR and the DI\_VAL for each relationship.
- 3.12.4.39. Query
- 3.12.4.40. If the LF SN query segment is not in the LFST, the LFP
  - will generate the LFDIKEYs for the new LF SN;
  - will select the related LFSN\_TYPEs through the LF selection process; and
  - will determine if the LF SN is a variant of a HFSN\_TYPE, assign appropriate keys and retain related digraph values. (See Section 3.12.4.43).

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- 3.12.4.41. The LFP will generate the LFDIKEYs for the LF SN segment (see Section 3.12.4.44).
- 3.12.4.42. The LFP will identify LFSN\_TYPEs in the LFST that are variants of the LF. (See Section 3.12.4.11 for the identification process.)
- 3.12.4.43. The LFP will determine if a LF SN segment that was not identified as a HFSN\_VAR and that was not found in the LFST is a potential variant of a HFSN\_TYPE.
  - 3.12.4.43.1. The LFP will access the HFST Data Store and perform a digraph evaluation between the LF SN and each HFSN\_TYPE. (See Section 3.11.4.19.4 for details of the procedure and formula for performing a digraph evaluation.)
  - 3.12.4.43.2. The digraph value must pass a threshold for the LF SN to be considered a variant of a HFSN\_TYPE(s), the High Frequency Surname Variant Threshold (HFSV Threshold).
  - 3.12.4.43.3. The LFP will access the Hispanic Parameter Data Store to determine the HFSV Threshold that the digraph value must pass for the LF SN to qualify as a variant of a HFSN\_TYPE.
  - 3.12.4.43.4. If the LF SN segment passes the HFSV Threshold, the LFP will assign HFSN\_VAR Key(s) to the LF SN segment.
    - 3.12.4.43.4.1. The HFSN\_VAR Key will be the ID\_NO associated with the HFSN\_VAR that is equal to the HFSN\_TYPE.
      - 3.12.4.43.4.1.1. That is, the LF SN segment will be associated with the parent HFSN\_TYPE only.
      - 3.12.4.43.4.1.2. A LF SN may be a variant of multiple HFSN\_TYPEs and may therefore receive multiple HFSN\_VAR Keys.
    - 3.12.4.43.4.2. The calculated digraph value will be associated with each HFSN\_VAR Key.
  - 3.12.4.43.5. If, by virtue of this process, all LF SN segments in a query are set equal to HFSN\_VAR Keys, the LFP will direct the query record to the HFP (Section 3.11.) for generation of Given Name Keys, submission to the High Frequency Decision Matrix (HDM) and identification of retrieval criteria.

# 3.12.4.44. Generating LFDIKEYs

- 3.12.4.44.1. The LFDIKEY is
  - 1) a set of digraphs formed from the LF SN segment beginning with the leftmost character and
  - 2) a set of positional variants on those digraphs.

- 3.12.4.44.2. Positional information will be associated with each digraph.
- 3.12.4.44.3. Base Keys
- 3.12.4.44.4. The LFP will begin with the leftmost character and generate up to four digraph keys (Base Keys) from the (up to) five leftmost characters of the LF SN segment.
  - 3.12.4.44.4.1. The first two characters form a digraph, the second and third characters form a digraph, the third and fourth characters form a digraph and the fourth and fifth characters form a digraph.
  - 3.12.4.44.4.2. Positional information will be included: 1, 2, 3, 4, respectively: DI1, DI2, DI3, DI4.
- 3.12.4.44.5. If the LF SN segment has fewer than five characters, the LFP will generate fewer than four Base Keys, up to the number of characters in the LF SN.
- 3.12.4.44.6. Positional information will be included.
- 3.12.4.44.7. Position Keys
- 3.12.4.44.8. The LFP will generate from the Base Keys up to six additional Position Keys from the Base Keys.
  - 3.12.4.44.8.1. A maximum of ten keys (Base + Position) will be generated.
  - 3.12.4.44.8.2. The Position Keys have the same characters as the Base Keys but contain different positional information.
  - 3.12.4.44.8.3. For segments with 5 or more characters:
  - 3.12.4.44.8.4. The LFP will produce a Position Key on the first Base Key with Position 2.
  - 3.12.4.44.8.5. The LFP will produce Position Keys on the second Base Key with Position 1 and Position 3.
  - 3.12.4.44.8.6. The LFP will produce Position Keys on the third Base Key with Position 2 and Position 4.
  - 3.12.4.44.8.7. The LFP will produce a Position Key on the fourth Base Key with Position 3. No Position Key is generated for Position 5 because the maximum of 10 keys has been reached.
  - 3.12.4.44.8.8. For segments with fewer than 5 characters:
  - 3.12.4.44.8.9. The LFP will produce Position Keys in the same way as for longer LF SN segments.

- 3.12.4.44.8.9.1. No Position Key will be generated for the final Base Key with a position to the right of the final character.
- 3.12.4.44.8.9.2. The total number of LFDIKEYs will be fewer than with a longer LF SN segment.
- 3.12.4.44.8.9.3. In GOMA, the LFP will generate a total of 7 keys: the Base Keys GO1, OM2 and MA3, and the Position Keys, GO2, OM1, OM3, and MA2. (Note: No MA4 Position Key is produced for the final digraph.)

Figure 21: Example: LFDIKEYs for LF SN Segments

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LF SN SEGMENT	LFDIKEYS: BASE KEYS	LFDIKEYS: POSITION KEYS
CARRIOS	CA1 / AR2 / RR3 / RI4	CA2 / AR1 / AR3 / RR2 / RR4 / RI3
BALA	BA1/AL2/LA3	BA2/AL1/AL3/LA2

- 3.12.4.44.9. Building LF Retrieval Keys (Query)
- 3.12.4.44.10. General
- 3.12.4.44.11. Each LF SN segment has been assigned a DI\_KEY or set of DI\_KEYs.
- 3.12.4.44.12. A LF SN segment may also have been assigned one or more HFSN\_VAR Keys.
- 3.12.4.44.13. The LFP has sent queries with all HFSN\_KEYs and/or HFSN\_VAR Keys (including SN\_INIT Keys) to the HFP for further processing.
- 3.12.4.44.14. The LFP will build sets of retrieval keys for mixed frequency queries (at least one HF key and one LF SN key in the string) and for queries with all low frequency keys (all SN in the string must be DI\_KEYs).
  - 3.12.4.44.14.1. A single query may have various formats all HF, mixed and/or all-LF SN depending on the results of LF processing prior to this stage.
- 3.12.4.44.15. Mixed frequency queries will not contain SN\_INIT Keys.
  - 3.12.4.44.15.1. SN\_INIT Keys may occur with HF SN keys, in which case the record will be treated as an all-HF SN record.
  - 3.12.4.44.15.2. SN\_INIT Keys may occur with LF SN keys, in which case the record will be treated as an all-LF SN record.

- 3.12.4.44.16. Queries with Mixed Frequency (HF + LF) Surnames
- 3.12.4.44.17. Type 1:
- 3.12.4.44.18. If one SN in the query is a HF SN and has an associated HFSN\_KEY and one SN in the query record is a LF SN segment and has associated DI\_KEYs, the LFP will build a Mixed Key of the HFSN\_KEY and each DI\_KEY (and the associated DI\_VALs).
  - 3.12.4.44.18.1. The HFSN\_KEY represents a set of variants of one HFSN\_TYPE.
    - 3.12.4.44.18.1.1. GARCIA, GARCA, GARZA are all digraph variants of the HFSN\_TYPE GARCIA, which has the SET\_ID 0001.
    - 3.12.4.44.18.1.2. Record adds and queries will already have been assigned the HFSN\_KEY through the HFP.
  - 3.12.4.44.18.2. The DI\_KEY represents a *single* low frequency surname type that has qualified through the LF SN selection process.

Figure 22: Example: Building Mixed HF/LF SN Retrieval Keys with HFSN\_KEY and DI\_KEYs

QUERY NAME: GARCIA FLORENZAN	HFSN_KEY and (LF) DI_KEY
GARCIA (HF)	GARCIA → 001
FLORENZAN (LF)	FLORENZAN → 000189
GARCIA (HF)	GARCIA → 001
LORENZ (LF)	LORENZ → 000412

## 3.12.4.44.19. Type 2:

- 3.12.4.44.20. If one SN in the query record is a HF SN and has an associated HFSN\_VAR Key (generated by the LFP) and one SN in the query record is a LF SN segment with associated DI\_KEY(s), the LFP will build a Mixed Key of the HFSN\_VAR Key and the DI\_KEY for each qualifying LFSN\_TYPE.
  - 3.12.4.44.20.1. The HFSN\_VAR represents a single HFSN\_TYPE and not a set of variants.
    - 3.12.4.44.20.1.1. Record adds and queries will already have been assigned the HFSN\_VAR Key through the LFP.

3.12.4.44.20.2. The DI\_KEY represents a *single* low frequency surname type that has qualified through the LF SN selection process.

Figure 23: Example: Building Mixed HF/LF SN Retrieval Keys with HFSN\_VAR Keys and DI\_KEYs

QUERY NAME: GARCIA FLORENZAN	HFSN_VAR and (LF) DI_KEY
BOMEZ (LF → HFSN_VAR)	BOMEZ → 016978
FLORENZAN (LF)	FLORENZAN → 000189
BOMEZ (LF → HFSN_VAR)	BOMEZ → 016978
LORENZ (LF)	LORENZ → 000412.

- 3.12.4.44.21. It is likely that there will be multiple DI\_KEYs for each LF SN segment, resulting in multiple Mixed Keys.
- 3.12.4.44.22. Once the Mixed SN Keys have been generated (and. DI\_VALs associated with the appropriate keys), the LFP will send any query that contains mixed HF and LF Keys to the HFP (Section 3.11.4.5) for Given Name processing and identification of retrieval criteria from the Hispanic Decision Matrix.
- 3.12.4.44.23. Queries with All Low Frequency (LF + LF)
  Surnames
- 3.12.4.44.24. The LFP will identify the LF Keys associated with query formats made up solely of LF SN segments (or a LF SN segment and SN\_INIT Key(s)).
  - 3.12.4.44.24.1. The LFP has qualified one or more LF SN segments from the LFST as variants of each LF query SN.
  - 3.12.4.44.24.2. Each qualifying LF segment has been assigned a LF Key, the DI\_KEY, and has an associated digraph value, DI\_VAL.

Figure 24: Example: Low Frequency DI\_KEYs and Associated Digraph Values

QUERY NAME: TOREAT FLORENZAN	LFST ID_NO	DI_KEYs + DI_VAL
TOREAT	TOREAT → 000714	000714 (1.00)
THORET	THORET → 000652	000652 (0.57)
FLORENZAN	FLORENZAN → 000189	000189 (1.00)
FLORESZ	FLORESZ → 000232	000232 (0.56)
LORENZ	LORENZ → 000412	000412 (0.59)

3.12.4.44.25. The LFP will direct a query record with all DI\_KEYs and their digraph values (or DI\_KEYs and SN\_INIT Keys) to the Hispanic Search Engine for retrieval of database records.

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#### 3.12.5. Subordinates

None.

## 3.13. HISPANIC SEARCH ENGINE MODULE DECOMPOSITION

#### 3.13.1. Identification

This module is known as the Hispanic Search Engine (HSE).

## 3.13.2. Type

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- 3.13.2.1. The HSE is a function that applies to queries only.
- 3.13.2.2. The HSE will accept name keys and retrieval criteria from the HFP and the LFP.
  - 3.13.2.3. The module must follow the HFP and LFP.

## 3.13.3. Purpose

The HSE will retrieve records from the VLDB based on criteria identified by the High Frequency Processor and the Low Frequency Processor. These criteria will delimit the set of records that can qualify for retrieval. The system must be sure that the criteria have all been identified and can be associated with database records (whether through database design and/or key generation).

### 3.13.4. Function

- 3.13.5. HNA-E will not handle records with Last Name Unknown (LNU).
- 3.13.6. The HSE will permit First Name Unknown (FNU).
  - 3.13.6.1. The processing of FNU will supersede other GN restrictions.
  - 3.13.6.2. The HSE will retrieve any database GN when FNU occurs in the query.
  - 3.13.6.3. The HSE will retrieve any FNU in the database for any query GN.

## 3.13.7. High Frequency Retrieval

- 3.13.7.1. High frequency retrieval will include records with HFSN\_KEYs, HFSN\_VAR Keys and SN\_INIT Keys that occur with the HF SN keys.
  - 3.13.7.1.1. The SN\_INIT Key will result in the retrieval of records that begin with or are equal to the variant initials identified by the SN\_INIT Key.
  - 3.13.7.1.2. The SN\_INIT Key is stored with each SN segment.
  - 3.13.7.1.3. All HF retrieval restrictions apply to the SN\_INIT Key, as if it were a HF segment *except* that
    - 3.13.7.1.3.1. If the SN\_INIT Key is the only key in the format, the HSE will not undertake a database search.
  - 3.13.7.1.4. No further, separate detailing of the SN\_INIT Key is given.

3.13.7.2. High frequency retrieval will include mixed HF and LF SN Keys but with no SN\_INIT Keys.

## 3.13.8. All HFSN\_KEYs (or SN\_INIT Key)

- 3.13.9. For queries with all HFSN\_KEYs, the HSE will retrieve records from the database records that
  - contain the appropriate SN format (position, more/fewer segments, different segments) as specified in the HDM,
  - contain the appropriate HFSN\_KEYs,
  - meet all the criteria identified in the HDM and
  - meet the GN restrictions.
- 3.13.10. The HFSN\_KEY will result in retrieval of the HFSN\_TYPE and all its variants.
  - 3.13.10.1. The HSE will further restrict the retrieval to records that match at least one key of the GN.
    - 3.13.10.1.1. If the query has produced only HFGN\_KEYs, only records that have at least one of the HFGN\_KEYs will be retrieved.
    - 3.13.10.1.2. If the query has produced mixed HFGN\_KEYs and GN\_INIT Keys, the HSE will retrieve records that match at least one of the HFGN\_KEY or one of the GN\_INIT Keys.
    - 3.13.10.1.3. If the query has produced only GN\_INIT Keys, the HSE will retrieve records that match at least one of the GN\_INIT Keys.

Figure 25: Example: Record Matching Criteria: All HFSN\_KEYs and HFGN\_KEYs

QUERY #1	RODRIGUEZ	LOPEZ	JOSE	CARLOS	CRITERIA
HFSN_KEY	002	010		l	
HFGN_KEY			0001	0007	
HDM FORMATS:					
1	RODRIGUEZ (002)	LOPEZ (010)			YOB5, RL4, MFU, GN contains 0001 or 0007
2	LOPEZ	RODRIGUEZ			YOB4, RL4, MFU, GN contains 0001 or 0007
3	RODRIGUEZ				YOB4, RL4, MFU, GN contains 0001 or 0007
4	LOPEZ				YOB2, RL1, MFU, GN contains 0001 or 0007
5 ·	RODRIGUEZ	* (ANY SN)			YOB2, RL1, FU, GN contains 0001 or 0007
6	LOPEZ	* (ANY SN)			YOBO, RLO, MFU, GN contains 0001 or 0007
7	* (ANY SN)	RODRIGUEZ			YOB0, RL0, MFU, GN contains 0001 or 0007
8	* (ANY SN)	LOPEZ			YOB0, RL0, MFU, GN contains 0001 or 0007

HNA-E Language Analysis Systems, Inc. 16

Figure 26: Example: Record Matching Criteria: All HFSN\_KEYs and Mixed HFGN\_KEYs and GN\_INIT Keys

QUERY #2	RODRIGUEZ	LOPEZ	JOSSE	CARLOS	CRITERIA
HFSN_KEY	002	010			
HFGN_KEY				0007	
GN_INIT Key(s)			041 (J, H)		
HDM FORMATS:					
1	RODRIGUEZ	LOPEZ (010)			YOB5, RL4, MFU, GN
	(002)				initial = J or H; or GN= 0007
2	LOPEZ	RODRIGUEZ			YOB4, RL4, MFU, GN
	1			İ	initial = J or H; or GN= 0007
3	RODRIGUEZ				YOB4, RL4, MFU, GN
			<u> </u>		initial = $J$ or $H$ ; or $GN = 0007$
4	LOPEZ				YOB2, RL1, MFU, GN
				l	initial = J or H; or GN= 0007
5	RODRIGUEZ	*			YOB2, RL1, FU, GN initial
			1		= J or H; or GN= 0007
6	LOPEZ	*			YOBO, RLO, MFU, GN
				1	initial = J or H; or GN= 0007
7	*	RODRIGUEZ			YOBO, RLO, MFU, GN
	<u> </u>		İ	<u> </u>	initial = J or H; or GN= 0007
8	•	LOPEZ		1	YOB0, RL0, MFU, GN
	1	<u> </u>	<u> </u>		initial = J or H; or GN= 0007

## 3.13.11. HFSN\_KEY and/or HFSN\_VAR Keys (or SN\_INIT Key)

- 3.13.12. For queries with mixed HFSN\_KEYs and HFSN\_VAR Keys and queries with all HFSN\_VAR Keys, the HSE will retrieve records from the database records that
  - contain the appropriate HFSN\_KEYs and/or HFSN\_VAR Keys,

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- contain the appropriate SN format (position, more/fewer segments, different segments) as specified in the HDM,
- · meet all the criteria identified in the HDM and
- meet the GN restrictions.
- 3.13.13. The HFSN\_VAR Key will retrieve a *single* HFSN\_TYPE and not the set of variants associated with the HFSN\_TYPE (e.g., the name LOPEZ but not all its variants; the variants will be retrieved by the LFP).
  - 3.13.13.1. The HSE will further restrict the retrieval to records that match at least one key of the GN.
    - 3.13.13.1.1. If the query has produced only HFGN\_KEYs, only records that have at least one of the HFGN\_KEYs will be retrieved.
    - 3.13.13.1.2. If the query has produced mixed HFGN\_KEYs and GN\_INIT Keys, the HSE will retrieve records that match at least one of the HFGN\_KEY or the GN\_INIT Keys.
    - 3.13.13.1.3. If the query has produced only GN\_INIT Keys, the HSE will retrieve records that match at least one of the GN\_INIT Keys.

Figure 27: Example: Record Matching Criteria: All HFSN\_KEY and/or HFSN\_VAR Keys

QUERY #1	RODRIGUEZ	SLOPEZ	JOSSE	CARLOS	CRITERIA
HFSN_KEY	002		Ĺ		
HFSN_VAR Key		00976			
HFGN_KEY				0007	·
GN_INIT Key(s)			041 (J, H)	L	
HDM FORMATS:					
1	RODRIGUEZ	LOPEZ			YOB5, RL4, MFU, GN
1	(002)	(000976)	l		initial = J or H; or GN= 0007
2	LOPEZ	RODRIGUEZ			YOB4, RL4, MFU, GN
			İ		initial = J or H; or GN= 0007
3	RODRIGUEZ				YOB4, RL4, MFU, GN
1				<u> </u>	initial = J or H; or GN= 0007
4	LOPEZ				YOB2, RL1, MFU, GN
					initial = J or H; or GN= 0007
5	RODRIGUEZ	*		-	YOB2, RL1, FU, GN initial
	l		i	<u> </u>	= J or H; or GN= 0007
6	LOPEZ	*			YOB0, RL0, MFU, GN
				<u> </u>	initial = J or H; or GN= 0007
7	*	RODRIGUEZ		Ι	YOB0, RL0, MFU, GN
				<u> </u>	initial = J or H; or GN= 0007
8	*	LOPEZ			YOBO, RLO, MFU, GN
			J	1	initial = J or H; or GN= 0007

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- 3.13.14. Mixed HFSN\_KEY and/or HFSN\_VAR Keys and LF DI\_KEYs (no SN\_INIT Key)
- 3.13.15. For queries with mixed HFSN\_KEYs/HFSN\_VAR Keys and LF DI\_KEYs, the HSE will retrieve records from the database records that
  - contain the appropriate HFSN\_KEYs/HFSN\_VAR Keys and DI\_KEYs,
  - contain the appropriate SN format (position, more/fewer segments, different segments) as retrieved from the HDM,
  - meet all the criteria identified in the HDM and
  - · meet the GN restrictions.
- 3.13.16. The LFP generated (multiple) query formats that contain a HF Key and a DI\_KEY.
  - 3.13.16.1. The DI\_KEY will retrieve an exact match on a single LFSN\_TYPE.
- 3.13.16.2. Each HFSN\_KEY or HFSN\_VAR Key may participate in query formats with several different DI\_KEYs that were identified as variants by the LFP.
  - 3.13.16.3. Each query format will serve as a different query.
  - 3.13.17. The HSE will further restrict the retrieval to records that match at least one key of the GN.
    - 3.13.17.1: If the query has produced only HFGN\_KEYs, only records that have at least one of the HFGN\_KEYs will be retrieved.
    - 3.13.17.2. If the query has produced mixed HFGN\_KEYs and GN\_INIT Keys, the HSE will retrieve records that match at least one of the HFGN\_KEY or the GN\_INIT Keys.
    - 3.13.17.3. If the query has produced only GN\_INIT Keys, the HSE will retrieve records that match at least one of the GN\_INIT Keys.

Figure 28: Example: Record Matching Criteria: Mixed HFSN\_KEYs/HFSN\_VAR Keys and LF DI\_KEYs

Keys and LF D1_I		<del></del>	T	T	an-man-
QUERY #1	THORET	SLOPEZ	JOSSE	CARLOS	CRITERIA
HFSN_KEY			<u>.l</u>		
HFSN_VAR Key		00976			
DI_KEY.	000652 (THORET)				
	000714 (TOREAT)				
HFGN_KEY				0007	
GN_INIT Key(s)			041 (J, H)		
HDM FORMATS:					
1	THORET	LOPEZ			YOB5, RL4, MFU, GN
	·	(000976)			initial = J or H; or GN= 0007
2	LOPEZ	THORET			YOB4, RL4, MFU, GN
					initial = $J$ or $H$ ; or $GN = 0007$
3	THORET				YOB4, RL4, MFU, GN
		İ	1		initial = J or H; or GN= 0007
4	LOPEZ				YOB2, RL1, MFU, GN
					initial = J or H; or GN= 0007
5	THORET	*			YOB2, RL1, FU, GN initial
			1	ł	= J or H; or GN= 0007
6	LOPEZ	* .			YOBO, RLO, MFU, GN
,	İ	İ		İ	initial = J or H; or GN= 0007
7	*	THORET			YOB0, RL0, MFU, GN
	1	1	1		initial = J or H; or GN= 0007
8	*	LOPEZ			YOB0, RL0, MFU, GN
					initial = J or H; or GN= 0007
1	TOREAT	LOPEZ		T T	YOB5, RL4, MFU, GN
				İ	initial = J or H; or GN= 0007
2	LOPEZ	TOREAT			YOB4, RL4, MFU, GN
				1	initial = J or H; or GN= 0007
3	TOREAT			1	YOB4, RL4, MFU, GN
					initial = J or H; or GN= 0007
4	LOPEZ			-	YOB2, RL1, MFU, GN
					initial = J or H; or GN= 0007
5	TOREAT	*			YOB2, RL1, FU, GN initial
			1	l	= J or H; or GN= 0007
6	LOPEZ	*			YOB0, RL0, MFU, GN
	. "			1	initial = J or H; or GN= 0007
7 .	*	TOREAT			YOBO, RLO, MFU, GN
		1 .		l	initial = J or H; or GN= 0007
8	*	LOPEZ			YOB0, RL0, MFU, GN
1	ı	1	1	1	initial = J or H; or GN= 0007

HNA-E Language Analysis Systems, Inc.

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- 3.13.18. The HSE will not retrieve database records that have already been retrieved with another key.
- 3.13.19. The HSE will retrieve the database record ID; the Dual-SN Formats; keys, their segment position and their related DI\_VALs; Record Gender; and TAQ tags.

### 3.13.20. Low Frequency Retrieval

- 3.13.21. The HSE will retrieve records from the database that contain one or both of the query DI\_KEYs in any SN position in the database record.
  - 3.13.21.1. The HSE will retrieve records that contain the DI\_KEYs within a specified YOB Range for a Refusal Code Level.
  - 3.13.21.2. The HSE will access the RLYOB Data Store to determine the Refusal Code Level and associated Year-of-Birth Range that will apply.
  - 3.13.21.3. The HSE will retrieve all records from the database with
    - both DI\_KEYs (or one DI\_KEY and one SN\_INIT Key) in either position and RLYOB restriction;
    - one of the DI\_KEYs alone and RLYOB restriction; and
    - one DI\_KEY in either position, if the Year-of-Birth Range is YOB2 and the Refusal Code Level is RL1 (i.e., 00 or Type 1 Serious).
- 3.13.22. The HSE will retrieve the database record; the record ID; the Dual-SN Formats; keys, their segment position and their related DI\_VALs; Record Gender; and TAQ tags.
- 3.13.23. The HSE will not retrieve a record that has already been retrieved using other access methods (i.e., Mixed Frequency SN or HF names).
- 3.13.24. All records retrieved from the database will be sent to the Hispanic Filter and Sorter.

## 3.14. HISPANIC FILTER AND SORTER MODULE DECOMPOSITION

#### 3.14.1. Identification

This module is known as the Hispanic Filter and Sorter (HFS).

#### 3.14.2. Type

- 3.14.2.1. The HFS is a module that accepts database records retrieved by the HSE.
- 3.14.2.2. The HFS compares each database record to the query record to determine if it qualifies for return to the user.
- 3.14.2.3. The HFS is constituted of two subordinate functions: the Hispanic Filter and the Hispanic Sorter.
- 3.14.2.4. The HFS must follow the Hispanic Search Engine (HSE).

## 3.14.3. Purpose

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- 3.14.3.1. The set of database records that the HSE will retrieve will be a set of records delimited by quite narrow retrieval criteria. The database records will have a digraph value associated with most SN segments and with many GN segments. However, the relative value of the database records to the query record will not be clear. The HFS will, therefore, evaluate each of the records retrieved for its proximity to a query record, will retain those that pass a pre-established threshold and will sort the resultant candidate list.
- 3.14.3.2. The filtering process will take into account a number of factors that play a role in determining the relative value of Hispanic *names*.
- 3.14.3.3. The filtering process will take into account factors that aid in the determination of the relative value of a Hispanic *records*.

#### 3.14.4. Function

The HFS will first compare and qualify the query name and database record name to determine a surname value (SN\_VAL), will then evaluate and qualify the query name and database record to determine a given name value (GN\_VAL) and will generate a composite score for the database records that qualified on the basis of name evaluation by factoring in values for Date-of-Birth, Refusal Level and Country of Birth.

The first comparison will be to identify an exact record match. All other comparison will be between the Dual-SN Format of the query and database record (for records with more than two surnames).

HNA-E Language Analysis Systems, Inc. 52

- 3.14.4.1. Filter Function of the HFS
- 3.14.4.2. General

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- 3.14.4.3. The Hispanic Filter and Sorter (HFS) will accept the candidate database records retrieved by the HSE.
- 3.14.4.4. The HFS will first determine if the query record and database record match exactly.
  - 3.14.4.4.1. The HFS will compare the base format of the query and database record; i.e., no derived format.
  - 3.14.4.4.2. The name (both SN and GN), Date-of-Birth and Country-of-Birth must match exactly.
  - 3.14.4.4.3. If the query and database records match exactly, the HFS will tag the record as an exact match and send the record directly to the Sorter Function of the HFS.
- 3.14.4.5. The HFS will calculate name scores for each candidate database record as it compares to the query record.
  - 3.14.4.5.1. The HFS will use the derived formats as the basis of record comparison.
  - 3.14.4.5.2. A score for the SN, the SN\_VAL, will be calculated.
  - 3.14.4.5.3. A score for the GN, the GN\_VAL, will be calculated.
    - 3.14.4.5.3.1. The HFS will adjust the digraph value retrieved with the database record by multiplying that value by factors assigned to several parameters.
    - 3.14.4.5.3.2. Factors (see Section 4.13) that contribute to the determination and evaluation of the name score (SN\_VAL and GN\_VAL) include
    - SNTHR
    - GNTHR
    - ASVAL
    - AGVAL
    - OPSVAL
    - OPGVAL
    - INITSN
    - INITGN
    - TAQASN
    - TAQAGN
    - TAQXSN
    - TAQXGN
    - RGNDR

HNA-E Language Analysis Systems, Inc. 53

3.14.4.5.3.3. To be included in the final candidate list, the score of the SN and the score of the GN must each pass predetermined SN and GN threshold levels (SNTHR and GNTHR).

#### 3.14.4.6. Surname Evaluation

- 3.14.4.7. A candidate record must pass a SN evaluation before it will be submitted to a GN evaluation.
- 3.14.4.8. No record with Last Name Unknown (LNU) will be handled by HNA-E.
- 3.14.4.9. The SN evaluation will be performed on the dervied formats (including the Dual-SN Formats) associated with the query and database records

#### 3.14.4.10. High Frequency SN Keys (HFSN\_KEYs or HFSN\_VAR Keys)

- 3.14.4.10.1. The HFS will compare the keys of the query and database and assign the DI\_VAL retrieved with the database record to the SN Comparands with matching keys.
  - 3.14.4.10.1.1. Only one assignment of DI\_VAL can be made for a match.
  - 3.14.4.10.1.2. If the query is GARCIA GOMEZ and the database record is GARCIA GARCIA, the HFS will assign the DI\_VAL to one GARCIA match only.
- 3.14.4.10.2. If the SN Keys do not match, the HFS will perform a digraph match of the segments with no assigned value (LOPEZ and GOMEZ in Figure 29) and will assign the digraph score to the DI\_VAL.

Figure 29: Example: Database Records with HFSN\_KEYs to be Evaluated by HFS

	SN#1	HFSN KEY	DI_VAL	SN#2	HFSN_KEY	DI_VAL
QUERY	GARCIA	0001		GOMEZ	0010	
DATABASE RECORDS	GARCIA	0001	1.00	BOMEZ	0010	0.67
	BARCIA	0001	0.71	GAMEZ	0010	0.67
	LOPEZ	0004	0.17	GARCIA	0001	1.00

## 3.14.4.11. Low Frequency SN Keys (DI\_KEYs)

- 3.14.4.11.1. The HFS will assign the DI\_VAL associated with the DI\_KEY to matching database and query DI\_KEYs.
  - 3.14.4.11.1.1. Only one assignment of DI\_VAL can be made for a match.

- 3.14.4.11.1.2. If the query is THORET FLORENZAN and the database record is THORET THORET, the HFS will assign the DI\_VAL to one THORET match only.
- 3.14.4.12. If the SN Keys do not match, the HFS will perform a digraph match of the segments with no assigned value (LOPEZ and GARCIA in Figure 30) and will assign the digraph score to the DI\_VAL.
  - 3.14.4.12.1. If there is more than one pair that does not have an assigned digraph value, the HFS will perform a digraph evaluation for each of the pairs. (See Section 3.14.4.16 for details of the digraph assignment.)
  - 3.14.4.12.2. Each value will be submitted to parameter evaluation.
  - 3.14.4.12.3. After all parameters have been applied, the HFS will choose the highest score for each pair. (See Section 3.14:4.17)

Figure 30: Example: Database Records with LF SN (Mixed or all LF Keys) to be Evaluated by HFS

	SN#1	HFSN_KEY/ DI-KEY	DI_VAL	SN#2	HFSN_KEY/ DI_KEY	DI_VAL
QUERY	GARCIA	0001		THORET	000652	
DATABASE RECORDS	GARCIA	0001	1.00	THORET	- 000652	1.00
	THORET	000652	1.00	BARCIA	0001	0.71
	LOPEZ	0004	0.00	THORET	000652	1.00

- 3.14.4.13. The HFS will adjust the DI\_VAL of each segment according to parameter values in the Hispanic Parameter Data Store (see Section 4.13 for details).
  - 3.14.4.13.1. The HFS will determine if the appropriate parameter conditions obtain.
  - 3.14.4.13.2. If the appropriate conditions are present, the DI\_VAL will be multiplied by the value assigned to the parameter and the DI\_VAL will be lowered.
  - 3.14.4.13.3. Parameter Conditions
  - 3.14.4.13.4. INITSN: Initial
    - 3.14.4.13.4.1. Definition 1: The SN segment is a single character in both comparands and the character matches exactly.
    - 3.14.4.13.4.2. Action: The HFS will make no change.
    - 3.14.4.13.4.3. Definition 2: A SN segment is a single character and its SN\_INIT Key matches the SN\_INIT Key of the other comparand.

- 3.14.4.13.4.4. Action: Assign the INITSN value to the comparison value (i.e., do not calculate the DI\_VAL). The initial may be subjected to any following actions (e.g., out-of-place segment).
- 3.14.4.13.4.5. Definition 3: A SN segment is a single character and the SN\_INIT Keys of the comparands do not match.
- 3.14.4.13.4.6. Action: Assign the INITNM value to the comparison value (i.e., do not calculate the DI\_VAL). The initial may be subjected to any following actions (e.g., out-of-place segment).
- 3.14.4.13.5. OPSVAL: Out-of-Place Surname Value
  - 3.14.4.13.5.1. Definition: A SN segment that is not in the same relative position in the SN string in both the database and query records.
  - 3.14.4.13.5.2. Action: Multiply the DI\_VAL by the OPSVAL.
- 3.14.4.13.6. ASVAL: Anchor Surname Value
  - 3.14.4.13.6.1. Definition: For database records that contain two SN segments, the database SN segments are in the correct position relative to the query SN segments.
  - 3.14.4.13.6.2. Action: Multiply the DI\_VAL of the second (rightmost) segment by the ASVAL.

Figure 31: Example 1: SN Parameter Evaluation: OPSN Applies

	GARCIA	GOMEZ
BOMEZ		0.67 * 0.65 = 0.44
GARCIA	1.00 * 0.65 = 0.65	

Figure 32: Example 2: SN Parameter Evaluation: OPSN Applies

	Tigure 32. Example	D. DITTUIGHTOLDE	iluation. Of biv rippine
į		GARCIA	GOMEZ
!	GAMEZ		0.67 * 0.65 = 0.44

Figure 33: Example 3: SN Parameter Evaluation: ASVAL Applies

·	GARCIA	GOMEZ
GARZA	0.62	
GOMEZ		1.00 * 0.65 = 0.65

### 3.14.4.13.7. TAQ Filter

3.14.4.13.8. All TAQ tags (ID\_NO, disposition, TAQ\_TYPE and associated SN stem) will be retrieved with the database record.

- 3.14.4.13.9. The HFS will evaluate any TAQs associated with the SN segments being evaluated, except Stranded Prefixes (see Section 3.5.4.2.7.3).
  - 3.14.4.13.9.1. A Stranded Prefix will not play a role in the record comparison.
- 3.14.4.13.10. Single TAQs
- 3.14.4.13.11. Missing TAQs
- 3.14.4.13.12. TAQASN: Absent TAQ Value
  - 3.14.4.13.12.1. Definition 1: One of the two comparands (query/database SN segment) has a TAQ tag, the other does not.
  - 3.14.4.13.12.2. Definition 2: Both comparands (query/database SN segments) have a single TAQ tag, one is a TAQ DELETE, the other a TAQ DISREGARD.
  - 3.14.4.13.12.3. Action: Multiply the DI\_VAL by the TAQASN value.

Figure 34: Example: TAQ DISREGARD (DE) and No TAQ

	DE VARGAS
VARGAS	1.00 * 0.90 = 0.90

Figure 35: Example: TAQ DISREGARD (DE) and TAQ DELETE (DR)

	DE VARGAS
DR VARGAS	1.00 * 0.90 = 0.90

3.14.4.13.13. TAQ DELETE

3.14.4.13.14. TAQXSN: Deleted TAQ Value

- 3.14.4.13.14.1. Definition: Both SN comparands have a single TAQ DELETE tag.
- 3.14.4.13.14.2. Action:
- 3.14.4.13.14.3. If the TAQ DELETE tags refer to the same TAQ segment, the DI\_VAL will be unchanged.
- 3.14.4.13.14.4. If the TAQ DELETE tags refer to different TAQ DELETE segments, multiply the DI\_VAL by the TAQXSN value.

Figure 36: Example: Same TAQ DELETE (DR)

	DR VARGAS
DR VARGAS	1.00

Figure 37: Example: Different TAQ DELETEs (DR and SR)

	SR VARGAS
DR VARGAS	1.00 * 0.850 = 0.85

### 3.14.4.13.15. TAQ DISREGARD

- 3.14.4.13.15.1. Definition: The HFS will access the TAQ Filter
  Data Store (TF) to process records that both contain SN
  TAQ segments that have been tagged as DISREGARD.
- 3.14.4.13.15.2. Action 1: The HFS will assign TAQDIS#1 to the TAQ DISREGARD segment for the database SN segment and TAQDIS#2 to the TAQ DISREGARD segment for the query SN segment.
- 3.14.4.13.15.3. Action 2: If the two TAQ DISREGARD segments match, the DI\_VAL will remain unchanged.
- 3.14.4.13.15.4. Action 3: If the two TAQ DISREGARD segments do not match, the HFS will identify the TF\_VALUE for the pair in the TF.
  - 3.14.4.13.15.4.1. The HFS will multiply the DI\_VAL by the TF\_VALUE for the pair.

Figure 38: Example: Different TAQ DISREGARDs (DE and LA)

	DE PENA
LA PENA	1.00 * 0.75 = 0.75

### 3.14.4.13.16. Multipart TAQs

- 3.14.4.13.16.1. Definition: If at least one SN comparand has multipart TAQ tags (they may be all DISREGARD, all DELETE, or mixed DISREGARD/DELETE), the HFS will perform the following analyses.
- 3.14.4.13.16.2. Action: If all TAQs match, HFS will make no change in the DI\_VAL.

## 3.14.4.13.16.3. TAQ DELETEs

- 3.14.4.13.16.3.1. Definition: All DELETE tags
- 3.14.4.13.16.3.2. Action 1: If any DELETE TAQ matches, the HFS applies no change.
- 3.14.4.13.16.3.3. Action 2: If no DELETE TAQs match, multiply the DI\_VAL by the TAQXSN Value.

Figure 39: Example: Multiple TAQ DELETEs with Some Match

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	REV DR VARGAS
REV VARGAS	1.00

Figure 40: Example: Multiple TAO DELETEs with No Match

1.5aic to. Example. Mainple II	Q DEBETES WITH THE INTEREST
· ·	GENERAL DR VARGAS
REV SR VARGAS	1.00 * 0.85 = 0.85

## 3.14.4.13.16.4. TAQ DISREGARDs

3.14.4.13.16.4.1. Definition: All DISREGARD tags

3.14.4.13.16.4.2. Action 1: If any TAQ DISREGARD segment matches, the HFS will make no change in the DI\_VAL.

3.14.4.13.16.4.3. Action 2: If no TAQ DISREGARD segments match, the HFS will identify the highest match value from the TF (TF\_VALUE) and multiply that by the DI\_VAL.

Figure 41: Example: Multiple TAQ DISREGARDs with Matching TAQ Segment (DE LAS/DE LOS)

	DE LAS LUNAS
DE LOS LUNAS	1.00

Figure 42: Example: Multiple TAQ DISREGARDs with No Matching TAQ Segment (DE SANTA/LA)

		DE SANTA MARIA
Ì	LA MARIA	1.00 * 0.75 = 0.75

## 3.14.4.13.16.5. TAQ DISREGARD and DELETEs

3.14.4.13.16.5.1. Definition: Mixed DISREGARD/DELETE tags

- 3.14.4.13.16.5.2. Action 1: If DISREGARD segments are present in both comparands and there is any match among the DISREGARD segments, the HFS will make no change in the DI\_VAL.
- 3.14.4.13.16.5.3. Action 2: If DISREGARD segments are present in both comparands and there is no match among the DISREGARD segments, the HFS will determine the highest match value from the TF for any DISREGARD tags and multiply the DI\_VAL by that value. (That is, ignore any DELETE tags.)

- 3.14.4.13.16.5.4. Action 3: If a DISREGARD segment is in one comparand and not the other and the two comparands have at least one DELETE tag that matches, the HFS will make no change in the DI\_VAL.
- 3.14.4.13.16.5.5. Action 4: If a DISREGARD segment is in one comparand and not the other and the two comparands have DELETE tags that do not match, multiply the DI\_VAL by the TAQXSN.

Figure 43: Example: Multiple TAQs, DISREGARDs (DE/LOS)

The Co.	SR DE VARGAS
DR LOS VARGAS	1.00* 0.75 = 0.75

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Figure 44: Example: Multiple TAQs, DELETEs (DRA/DR)

	DRA DE VARGAS
DR VARGAS	1.00 * 0.85 = 0.85

- 3.14.4.14. After all parameters have been applied, the HFS will calculate the SN\_VAL.
  - 3.14.4.14.1. The HFS will choose the highest value for the row and column for any SN segments that have more than one digraph value assigned to them.
  - 3.14.4.14.2. The HFS will sum the DI\_VALs of all SN segments and will divide by the number of DI\_VALs.

Figure 45: Example 1: Filter Evaluation

	GARCIA	GARCIA GOMEZ	
BOMEZ		0.67 * 0.65 = 0.44	
GARCIA	1.00 * 0.65 = 0.65		

Figure 46: Example 2: Filter Evaluation

	GARCIA	GOMEZ
GAMEZ		0.67 * 0.65 = 0.44

Figure 47: Example 3: Filter Evaluation

	GARCIA	GOMEZ
GARZA	0.62	
GOMEZ		1.00 * 0.65 = 0.65

3.14.4.14.3. In Figure 45, 0.44 + 0.65 / 2 = 0.55

3.14.4.14.4. In Figure 46, 0.44 / 1 = 0.44

3.14.4.14.5. In Figure 47, 0.62 + 0.65 / 2 = 0.64

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- 3.14.4.15. The HFS will compare the SN\_VAL to the SNTHR.
  - 3.14.4.15.1. The SN\_VAL must be equal to or greater than the SNTHR.
  - 3.14.4.15.2. If the SNTHR were 0.60, only Example 3 above would pass.
  - 3.14.4.15.3. The record must pass the SNTHR to qualify for Given Name Evaluation.

### 3.14.4.16. Given Name Evaluation

- 3.14.4.16.1. The HFS will evaluate the GN in a similar way to the SN evaluation.
- 3.14.4.16.2. The HFS will assign a DI\_VAL of 1.00 to any match with FNU.
- 3.14.4.16.3. The GN format will permit more than two GN segments to be evaluated.
  - 3.14.4.16.3.1. If the segment pair has a matching HFGN\_KEY, the digraph value (DI\_VAL) retrieved with that key will be assigned to the pair being evaluated.
  - 3.14.4.16.3.2. For any segment pair that does not have a HFGN\_KEY and associated DI\_VAL, the DI\_VAL will be calculated. (See Section 3.11.4.19.4 for digraph evaluation.)
  - 3.14.4.16.3.3. The HFS will not calculate a digraph value for a GN\_INIT Key value or GN initial.
    - 3.14.4.16.3.3.1. The HFS will calculate the digraph relationship for all segments that have not been assigned a DI\_VAL.
    - 3.14.4.16.3.3.2. The HFS will not compare names that have a DI\_VAL assigned.

Figure 48: Example: GN Digraph Evaluation

1	MARIA	LORNA	SILVIA	CATERINA
CATHERINA				0.74
				(HFGN_KEY)
MARIA	1.00 (HFGN_KEY)		, .	
LARA		0.36	. 0.08	

MILDRED	0.00	0.07	

- 3.14.4.16.4. The DI\_VAL of each GN segment will be adjusted by several GN parameters.
- 3.14.4.16.5. INITGN: Given Name Initial
  - 3.14.4.16.5.1. Definition 1: The GN segment is a single character in both comparands and the character matches exactly.
  - 3.14.4.16.5.2. Action: The HFS will make no change.
  - 3.14.4.16.5.3. Definition 2: A GN segment is a single character and its GN\_INIT Key matches the GN\_INIT Key of the other comparand.
  - 3.14.4.16.5.4. Action: Assign the INITGN value to the comparison value (i.e., do not calculate the DI\_VAL). The initial may be subjected to any following actions (e.g., out-of-place segment).
  - 3.14.4.16.5.5. Definition 3: A GN segment is a single character and the GN\_INIT Keys of the comparands do not match.
  - 3.14.4.16.5.6. Action: Assign the INITNM value to the comparison value (i.e., do not calculate the DI\_VAL). The initial may be subjected to any following actions (e.g., out-of-place segment).
- 3.14.4.16.6. OPGVAL: Out-of-Place Given Name Value
  - 3.14.4.16.6.1. Definition: A GN segment that is not in the same relative position in the GN string in both the database and query records.
  - 3.14.4.16.6.2. Action: Multiply the DI\_VAL by the OPGVAL.
- 3.14.4.16.7. AGVAL: Anchor Given Name Value
  - 3.14.4.16.7.1. Definition: For database records that contain two or more GN segments, the database SN segments are in the correct position relative to the query SN segments.
  - 3.14.4.16.7.2. Action: Multiply the DI\_VAL of the GN segments to the right of the first (leftmost segment) by the AGVAL.

Figure 49: Example 1: GN Parameter Evaluation: OPGN Applies

	MARIA	CATHERINA
KATHERINA		0.90 * 0.65 = 0.59
MARIA	1.00 * 0.65 = 0.65	

Figure 50: Example 2: GN Parameter Evaluation: OPGN Applies

	JOSE	BARTOLOMEO
BARTO		0.71 * 0.65 = 0.46

Figure 51: Example 3: GN Parameter Evaluation: AGVAL Applies

	JUAN	MARIO
JUANA	0.73	
MARIA		0.83 * 0.65 = 0.54

Figure 52: Example 4: Given Name Parameter Evaluation

	MARIA	LARA	MILDRED	CATERINA
CATHERINA				0.74*0.65 = 0.48
	<u> </u>			(OPGVAL)
MARIA	1.00*0.65 = 0.65 (OPGVAL)			
	(OFGVAL)			ļ <u> </u>
LORNA	ļ.	0.36*0.65 = 0.23	0.08*0.65 = 0.05	
		(OPGVAL)	(OPGVAL)	
SILVIA		0.00*0.65 = 0.00	0.07*0.65 = 0.05	
•	•	(OPGVAL)	(OPGVAL)	

- 3.14.4.16.8. TAQ Evaluation will proceed as with the SN, mutatis mutandi (See Section 3.14.4.13.7).
- 3.14.4.17. After all GN evaluations have been performed, the HFS will choose the highest score for each GN segment that has multiple DI\_VALs (i.e., those for which no DI\_VAL was retrieved with the key).
  - 3.14.4.17.1. The highest score for **both** the row and column must be
  - 3.14.4.17.2. Only one score per row and column is permitted.
  - 3.14.4.17.3. If two scores are equal, only one is chosen.
  - 3.14.4.17.4. In the example above, the higher score for LORNA is on the match with LARA (0.23); for SILVIA, MILDRED (0.05).
    - 3.14.4.17.4.1. Note that MILDRED scores are equal, but the row for LORNA has already been chosen.
    - 3.14.4.17.4.2. Only one value can be chosen for each row and column.
- 3.14.4.18. The HFS will sum all DI\_VALs from the comparison matrix and will divide by the number of DI\_VALs to produce the GN score.
  - 3.14.4.18.1. In Example 1, 0.59 + 0.65/2 = 0.62
  - 3.14.4.18.2. In Example 2, 0.46/1 = 0.46
  - 3.14.4.18.3. In Example 3, 0.73 + 0.54/2 = 0.64
  - 3.14.4.18.4. In Example 4, 0.48 + 0.65 + 0.23 + 0.05/4 = 0.33

- 3.14.4.19. The HFS will further evaluate the Given Name by comparing the record gender of the two comparands.
  - 3.14.4.19.1. If the record genders match, no action will take place.
  - 3.14.4.19.2. If the record genders do not match, the HFS will apply the RGNDR value to the GN score.
    - 3.14.4.19.2.1. The HFS will access the TF to determine the RGNDR Value.
    - 3.14.4.19.2.2. The HFS will multiply the GN score by the RGNDR value.
- 3.14.4.20. The value resulting from the full GN evaluation will be the GN\_VAL.
- 3.14.4.21. The HFS will compare the GN\_VAL to the GNTHR.
  - 3.14.4.21.1. The GN\_VAL must be equal to or greater than the GNTHR.
  - 3.14.4.21.2. The GN\_VAL must pass the GNTHR for the record to qualify for calculation of the Composite Score.
- 3.14.4.22. Composite Score
- 3.14.4.23. The HFS will develop a composite score for two comparands that will reflect the proximity of the query and database *records*.
- 3.14.4.24. The Composite Score will be used to rank order the records being evaluated.
- 3.14.4.25. The Name is one component of the Composite Score; others are the Refusal Level, Date-of-Birth and Country of Birth.
  - 3.14.4.25.1. The HFS will adjust the GN\_VAL and the SN\_VAL by factors that reflect the proximity of the Refusal Level, Date-of-Birth and Country of Birth.
  - 3.14.4.25.2. The GN\_VAL and SN\_VAL will be multiplied by RL, YOB and COB factors.

HNA-E Language Analysis Systems, Inc.

64

#### 3.14.4.26. Refusal Level Factor

- 3.14.4.27. The HFS will access the Refusal Code Level Data Store to determine the Refusal Level Category of the Refusal Code.
- 3.14.4.28. The HFS will access the Hispanic Parameter Data Store to find the PARM\_VAL associated with the Refusal Level (RL#).

#### 3.14.4.29. Date-of-Birth Factor

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- 3.14.4.30. The HFS will access the Year-of-Birth Range Data Store to determine the YOB Category, YOB#, of the Dates-of-Birth of the comparands. The highest value is applied to the relationship.
- 3.14.4.31. The HFS will access the Hispanic Parameter Data Store to find the PARM\_VAL associated with the YOB Category (YOB#).

#### 3.14.4.32. Country-of-Birth Factor

- 3.14.4.33. The HFS will access the Hispanic Country-of-Birth Category Data Store (HCOB) to determine the COB Category, COB#.
  - 3.14.4.33.1. The HFS will identify the COB#.
  - 3.14.4.33.2. The HFS will access the Hispanic Parameter Data Store to find the PARM\_VAL associated with the Country-of-Birth Category (COB#).

# 3.14.4.34. Calculating the Composite Score

- 3.14.4.35. The HFS will calculate a Composite Score by multiplying the SN\_VAL by the GN\_VAL by the RL# PARM\_VAL by the YOB# PARM\_VAL by the COB# PARM\_VAL.
- 3.14.4.36. Final Sort Function of the HFS
- 3.14.4.37. The HFS will order the final candidate list.
- 3.14.4.38. The HFS will place at the top of the candidate list all records that have been tagged as exact matches.
- 3.14.4.39. The HFS will then rank order in descending order of Composite Score all records for which a Composite Score has been calculated.
  - 3.14.4.39.1. The goal of the final sort is to place exact record matches on the top and to rank order the remaining records by the degree of contribution that each data element (SN, GN, DOB, COB, Refusal Code Level (RL)) makes to the overall record value.
  - 3.14.4.39.2. Further details of the sort will be derived from extensive discussion about the business requirements.
  - 3.14.4.39.3. Because the scores from the various pipes may not have been calculated in the same way, a method for evaluating the relative value of candidate records will have to be devised.

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# 3.14.4.40. Internal Sort Order

- 3.14.4.40.1. There may be cases in which the sorting criteria are met equally by more than 1 record.
- 3.14.4.40.2. Where multiple records qualify equally, there will be an internal sort order.

3.14.4.40.2.1. SN Score

3.14.4.40.2.2. GN Score

3.14.4.40.2.3. DOB Level

3.14.4.40.2.4. Refusal Code Level

3.14.4.40.2.5. COB Relationship

- 3.14.4.1. The HFS will return the top n records to the central CLASS-E sorter.
  - 3.14.4.41.1. The number of records to be returned will be a system setting.

#### 3.15. LINGUISTIC TRACE FACILITY MODULE DECOMPOSITION

#### 3.15.1. Identification

This module is known as the Linguistic Trace Facility (LTF).

# 3.15.2. **Type**

The LTF is a program that will interact with any or all modules and functions within those modules.

#### 3.15.3. Purpose

The LTF will allow system evaluators to access information about the system functions so that the quality of the content can be ensured. To diagnose and remedy problems associated with questionable system results, evaluators must have access to the results of system functionality at various points during the processing cycle.

### 3.15.4. Function

- 3.15.4.1. The LTF will be a mechanism that will copy and divert statistics, information, processing results to a file outside the main processing module.
- 3.15.4.2. The file will be readily accessible for on-line examination by system evaluators.
- 3.15.4.3. Multiple trace points will be identified when the system is built.
- 3.15.4.4. Examples of trace points:
  - Derived record formats
  - All keys generated for a query and for an add

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- · Records qualifying with the LFDI\_KEY
- SN and GN DI\_VAL
- SN\_VAL and GN\_VAL
- · Record Gender
- RL#, YOB#, COB# Values
- Sort considerations.

# 4. DATA DECOMPOSITION

#### 4.1. DATA

- 4.1.1. The input data for an HNA-E query will contain all information that is currently required by CLASS.
- 4.1.2. The input data for an HNA-E query will be in the standard format currently required by CLASS.
  - NAME (Surname, Given Name);
    - The SN is a required name field and therefore must be filled.
    - Last Name Unknown (LNU) is not a permitted string in HNA-E.
    - The SN may be represented by a single character, which will be interpreted as an initial.
  - DOB (Date of Birth; Day Month Year); and
  - · COB (Country of Birth; FIPS codes).
- 4.1.3. In addition, the following will be specified:
  - Applicant Gender (AG): Male (M), Female (F), Unknown/Ambiguous (U).
  - A unique identifier (UID) (as defined in CLASS-E).
- 4.1.4. For record adds, additional record information will be entered, as required by CLASS and CLASS-E: e.g., refusal code, province of birth.

#### 4.2. DATA COLLECTION

- 4.2.1. Two alternative approaches to tagging the name data are available: the name as an object and the name as a data element.
- 4.2.2. The system could define the name as an object that knows something about itself and collects information as it passes through the various processing modules.
  - 4.2.2.1. A name object would make the relevant information available to the various processing modules, as needed, from one consistent, predefined object.
- 4.2.2.2. A name object may also permit the same name to be handled in the same way on another occasion. Reuse of information would be especially valuable for HF names.
- 4.2.3. The second, alternative approach is to tag the specific items as they undergo processing or change, to access information in data stores as it is needed, and to tag the name or name segment for the relevant processes it undergoes.

#### 4.3. DATA STORES

- 4.3.1. Several of the Data Stores proposed could be collapsed into one data store (e.g., the HF SN Data Stores: HFST and HFSV); for ease and clarity of exposition and reference, the data stores have been maintained separately.
- 4.3.2. HNA-E will access X Data Stores:
  - Hispanic TAQ Data Store (HTD)
  - High Frequency Surname Type Data Store (HFST)
  - High Frequency Surname Variant Data Store (HFSV)
  - Low Frequency Surname Type Data Store (LFST)
  - Hispanic Given Name Type Data Store (HGT)
  - High Frequency Given Name Variant Data Store (HFGV)
  - Hispanic Character Data Store (HCD)
  - Hispanic Parameter Data Store (HPD)
  - High Frequency Decision Matrix (HDM)
  - Refusal Code Level Data Store (RCL
  - Year-of-Birth Range Data Store (YR)
  - Refusal Code Level/Year-of-Birth Range Data Store (RLYOB)
  - Country-of-Birth Proximity Data Store (COBPROX)
  - Hispanic Country-of-Birth Category Data Store (HCOB)
- 4.4. HISPANIC TITLE/AFFIX/QUALIFIER DATA STORE DECOMPOSITION Because the HNA-E design is viewed as an independent sub-program of the CLASS-E system, the Hispanic Title/Affix/Qualifier Data Store is presented here as

a separate table. It is strongly suggested, however, that CLASS-E support <u>one</u> TAQ Data Store in which the cultural affinity of each TAQ segment is indicated. This will reduce table maintenance and will provide a global picture of the handling of TAOs.

# 4.4.1. Identification

This data store is known as the Hispanic Title/Affix/Qualifier (TAQ) Data Store (HTD).

#### 4.4.2. Type

- 4.4.2.1. The HTD is a data store that contains the Hispanic-specific Title, Affix and Qualifier segments with additional information about the disposition of the items.
- 4.4.2.2. The HTD will be accessed by the Hispanic Name Preprocessor (HNP) and the Hispanic Filter and Sorter (HFS).
- 4.4.2.3. The format of the HTD will be

Figure 53: Format: Hispanic TAQ Data Store (HTD)

DATA FIELD	DATA TYPE	FIELD SIZE	DATA RANGE/VALUE
ID_NO	integer	4	09999
TAQ_FORM	character	15	alphabetics
TAQ_TYPE	character	1	T, I, P, S Q
DELETE	integer	1	1, 0 (True, False)
DISREGARD	integer	1	1, 0 (True, False)
REMOVE	integer	1	1, 0 (True, False)

#### 4.4.2.4. Definitions

- 4.4.2.4.1. ID\_NO: a unique, arbitrary number that identifies the TAQ segment.
- 4.4.2.4.2. TAQ\_FORM: the string that represents the TAQ; the TAQ\_FORM may be a multipart string (i.e., a string that includes internal white space).
- 4.4.2.4.3. TAQ\_TYPE: an indicator of the kind of TAQ segment present: a title (T), prefix (P), infix (I), suffix (S), or qualifier (Q).

#### 4.4.2.4.4. DELETE:

- 4.4.2.4.4.1. The segment is to be removed from all further consideration in the name search process.
  - 4.4.2.4.4.2. The segment is referenced in the filtering process.
  - 4.4.2.4.4.3. The segment is not removed from the original record and is returned with the record to the user.

4.4.2.4.4.4. True (1) or False (0) indicates whether or not this function is to apply to the segment(s) under consideration.

#### 4.4.2.4.5. DISREGARD:

- 4.4.2.4.5.1. The segment is to be removed from further consideration in the name search process but will undergo special evaluation in the filtering process. It will be returned with the record to the user.
- 4.4.2.4.5.2. True (1) or False (0) indicates whether or not this function is to apply to the segment(s) under consideration.

#### 4.4.2.4.6. REMOVE:

- 4.4.2.4.6.1. The segment occurs attached to the name stem.
- 4.4.2.4.6.2. The conjoined TAQ will be separated from a base name segment. (See Section 3.5.4.4.3).
- 4.4.2.4.6.3. True (1) or False (0) indicates whether or not this function is to apply to the segment(s) under consideration.
- 4.4.2.4.6.4. The separated segment will also be marked for DELETE/DISREGARD treatment.

#### 4.4.3. Purpose

Peripheral elements (Titles, Affixes, and Qualifiers) in names do not contribute as much to the name evaluation as does the name stem. Identifying and removing these elements in the name processing component is important. They do, however, contribute to the overall value of a name when determining the proximity of one name to another. They will therefore contribute some value to the filtering and sorting processes.

# 4.4.4. Function

The HTD serves as a repository for all TAQ values and for the treatment that each will be subjected to.

# 4.5. HIGH FREQUENCY SURNAME TYPE DATA STORE DECOMPOSITION

#### 4.5.1. Identification

- 4.5.1.1. This data store is known as the High Frequency Surname Type Data Store (HFST).
- 4.5.1.2. This data store could be merged with the High Frequency Surname Variant Data Store (HFSV).
  - 4.5.1.2.1. The ID\_NO would be different in the HFSV and would serve as a unique identifier for each entry.

- 4.5.1.2.2. The set of HFSN\_TYPEs, with no variants, would be derivable from the HFSN\_VARs with a DI\_VAL equal to 1.00.
- 4.5.1.2.3. The SET\_ID of the HFST and HFSV would be the same.

### 4.5.2. Type

- 4.5.2.1. The HFST data store consists of the 500 most frequently occurring HF SN segment types (i.e., unique occurrence).
- 4.5.2.2. The HFST will be accessed by the Hispanic Surname Segmenter, Hispanic Segment Positioner, and the Frequency Path Director modules.
- 4.5.2.3. The format of the HFST will be

Figure 54: Format: High Frequency Surname Type Data Store (HFST)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE
ID NO	integer	4	19999
HFSN TYPE	character	24	alphabetics
SET ID	integer	4	19999

Figure 55: Example: Piece of HFST

ID_NO	HFSN_TYPE	SET_ID
0001	GARCIA	0001
0002	RODRIGUEZ	0002
0003	HERNANDEZ	0003
0004	LOPEZ	0004
0005	MARTINEZ	0005
0006	GONZALEZ	0006
0007	PEREZ	0007
0008	SANCHEZ	0008
0009	RAMIREZ	0009
0010	GOMEZ	0010
0011		0011

#### 4.5.2.4. Definitions

- 4.5.2.4.1. ID\_NO will be a unique numerical identifier for each of the HF SN segments, HFSN\_TYPEs.
- 4.5.2.4.2. HFSN\_TYPE will contain a unique character string that represents one of the 500 most frequently occurring Hispanic surname stems.
- 4.5.2.4.3. SET\_ID will be the unique identifier for the *set* of variants of the HFSN\_TYPE and will be used as the HFSN\_KEY.

# 4.6. HIGH FREQUENCY SURNAME VARIANT DATA STORE DECOMPOSITION

# 4.6.1. Identification

- 4.6.1.1. This data store is known as the High Frequency Surname Variant Data Store (HFSV).
- 4.6.1.2. This data store will be updated in real time as variants qualify for inclusion in the data store. (See Section 3.12.4.38)
- 4.6.1.3. This data store could be merged with the HFST (See Section 4.5.1.2.)

#### 4.6.2. Type

- 4.6.2.1. The HFSV is a data store that consists of a HFSN\_TYPE segment with a variant of that segment and a value that represents the degree of digraph proximity of the HFSN\_TYPE and its variant.
- 4.6.2.2. The HFSV is a data store that will have between 75,000 and 100,000 rows.
- 4.6.2.3. A name segment may be the variant of more than one HFSN\_TYPE.
- 4.6.2.4. The HFSV will be accessed by the High Frequency Processor and Low Frequency Processor.
- 4.6.2.5. The format of the HFSV will be

Figure 56: Format: High Frequency Surname Variant Data Store (HFSV)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE
ID NO	integer	6	000000999999
HFSN_VAR	character	24	alphabetics
SET ID	integer	4	00009999
DI_VAL	decimal	4	0.001.00

Figure 57: Example: High Frequency Surname Variant Data Store

ID_NO	HFSN_VAR	SET_ID	DI_VAL
032711	PEREZ	0007	1.00
032712	PERES	0007	0.67
032713	PEREZA	0007	0.77
016976	GOMEZ	0010	1.00
016977	GOMES	0010	0.67
016978	BOMEZ	0010	0.67

## 4.6.2.6. Definitions

4.6.2.6.1. ID\_NO will be a unique numerical identifier for each HFSN\_VAR entry.

HNA-E Language Analysis Systems, Inc.

- 4.6.2.6.2. HFSN\_VAR will contain a character string that has been determined to be a variant of the HFSN\_TYPE with which it is associated. A HFSN\_VAR may be a variant of one or more of the HFSN\_TYPEs.
  - 4.6.2.6.2.1. A variant is defined as a name stem that shares a sufficient number of digraphs (strings of two characters) with the HFSN\_TYPE to pass a pre-determined threshold.
  - 4.6.2.6.2.2. A HFSN\_TYPE can be obtained from the HFST or from the HFSV as a HFSN\_VAR with a DI\_VAL equal to 1.00.
- 4.6.2.6.3. DI\_VAL is a two-place decimal value that represents the proximity of the HFSN\_TYPE and the HFSN\_VAR.
  - 4.6.2.6.3.1. The DI\_VAL is a calculation derived from the shared digraphs (strings of two characters) of the HFSN\_TYPE and the HFSN\_VAR associated with it.
  - 4.6.2.6.3.2. The calculation is determined in the following way:
    - 4.6.2.6.3.2.1. The digraphs are identified for each name stem, the HFSN\_TYPE (Comparand #1) and the HFSN\_VAR (Comparand #2).
      - 4.6.2.6.3.2.1.1. Each pair of alphabetic characters is identified: GOMEZ

        → GO / OM / ME / EZ
      - 4.6.2.6.3.2.1.2. A digraph is also formed of the initial boundary (#) and the first alphabetic character:

        GOMEZ → #G.
      - 4.6.2.6.3.2.1.3. A digraph is also formed of the final alphabetic character and the final boundary (#): GOMEZ

        → Z#.
    - 4.6.2.6.3.2.2. The number of shared digraphs is calculated; a digraph may match one digraph only.
    - 4.6.2.6.3.2.3. The number of shared digraphs is multiplied by 2 and divided by the total number of digraphs in comparand #1 added to the total number of digraphs in comparand #2.
    - 4.6.2.6.3.2.4. The formula is:

2 \* d / a + b, where d = the total number of shared digraphs; where a = the total number of digraphs in Comparand #1 and where b = the total number of digraphs in Comparand #2.

Figure 58: Example: Digraph Evaluation of Two Comparands

COMPARANDS	DIGRAPHS	SHARED DIGRAPHS (d)	DI_VAL
	#D DO OM MI IN NG GU UE EZ Z#	#D DO OM MI IN UE	2*d/a+b=12/20
DOMINGUEZ			
	#D DO OM MI IN NQ QU UE ES S#	= 6	.60
DOMINOUES			

# 4.6.3. Purpose

- 4.6.3.1. For HNA-E to be an effective retrieval system, it must be able to retrieve variants of query names. The impact on system performance can be dramatic, however, if traditional matching techniques are used to identify variant names. By assigning variants to the same set and recording their digraph value, querying a HF surname will result in the direct retrieval of variant records and their digraph values.
- 4.6.3.2. The HFSV also serves as a resource for identifying which HF surnames are related to a LF surname.

# 4.6.4. Function

The HFSV Data Store will be dynamically updated. (See Section 3.12.4.38 for details.)

# 4.7. HIGH FREQUENCY DECISION MATRIX DATA STORE

#### 4.7.1. Identification

This data store is known as the High Frequency Decision Matrix (HDM).

# 4.7.2. Type

- 4.7.2.1. The HDM is a data store that will provide criteria for database record retrieval for query records with HF name segments.
- 4.7.2.2. It will be accessed by the High Frequency Processor (HFP).

Figure 59: Format: Hispanic Decision Matrix (HDM)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE
OUERY SN FORMAT	character	2	A, B
DATABASE SN FORMAT	character	2	A, B, C
YOB RANGE (YOB#)	integer	1	06
REFUSAL CODE LEVEL	integer	1	04
(RL#)			
RECORD GENDER (RGNDR)	character	1 ,3	М, F, <u>U</u>

Figure 60: Example: Hispanic Decision Matrix (HDM) (Values for example only)

	Single-Segment SN							Two-Seg	ment SN	l .		
OUERY SN FORMAT	Α	Α.	Α		AB	AB	AB	AB	AB	AB	AB	AB
DATABASE SN FORMATS	Α	AB	BA		AB	BA	Α	В	AC	CA	CB	BC
YOB#	5	5	2		5	4	4	2	2 _	0	0	0
RL#	4	4	3		4	4	4	1	1	0	0	0_
RCNDR	MFU	MFU	MFU	1	MFU	MFU	MFU	MFU	FU	MFU	MFU	MFU

#### 4.7.3. Definitions

- 4.7.3.1. QUERY SN FORMAT: is a character string that is an abstract representation of the query SN. Each segment is represented by a single character, the leftmost A, the next B. The sequence also represents the position of the segment.
- 4.7.3.2. DATABASE SN FORMAT: is a character string that is an abstract representation of the possible and acceptable variations in the query SN which are relevant to the QUERY SN FORMAT and which will be retrieved from the database, given the conditions stipulated in the YOB RANGE (YOB#), REFUSAL CODE LEVEL (RL#) and RECORD GENDER (RGNDR). Each segment is represented by a single character.
  - 4.7.3.2.1. If the character is the same as a character in the QUERY SN FORMAT, it represents the same SN Key.
  - 4.7.3.2.2. If the character is different from a character in the QUERY SN FORMAT, it represents a different SN Key.
  - 4.7.3.2.3. If the character is in the same relative position as that in the query SN, it represents the same position in the SN string.
  - 4.7.3.2.4. If the character in not in the same relative position as that in the query SN, it represents a different (out-of) position in the SN string.

- 4.7.3.3. YOB RANGE (YOB#): is an integer that represents a YOB range specified in the YOB RANGE (YR) Data Store. (N.B. In this scheme, YOB# integer does not represent the year range itself. It refers to a table that specifies that YOB2, for example, represents an exact year-of-birth and that YOB3 represents a range of 1 year on either side of the query year (for a range total of 3 years).)
- 4.7.3.4. REFUSAL CODE LEVEL (RL#): is an integer that represents a Refusal Code Level specified in the REFUSAL CODE LEVEL Data Store. (N.B. In this scheme, this number represents a set of Refusal Codes that has a pre-determined degree of seriousness. The number given here does not signal the Refusal Code itself. The number is expanded in the Refusal Code Level Data Store, where 0, for example, might represent a 00 Refusal Code.)
- 4.7.3.5. RECORD GENDER (RGNDR): is a set of up to three characters that represent the required Record Gender of the database record.

#### 4.7.4. Purpose

Many Hispanic surnames occur with very high frequency; they also generally have at least two segments. Any retrieval system that captures only one of these names will have an inordinately high recall. Many of these records will not be at all relevant to the query record. Special treatment of high frequency names must entail some method of reducing the number of irrelevant records retrieved from the database. The HDM provides the information about how to delimit the records that will be retrieved from the database. A reduction in the recall will reduce post-processing time.

#### 4.7.5. Function

The HDM is a data store that consists of qualifying and delimiting criteria.

- 4.7.5.1. Qualifying criteria will be the number of SN segments, SN content, and SN segment positions.
- 4.7.5.2. Delimiting criteria will be Year-of-Birth (YOB) Range (YR), Refusal Code (RC) Level (RL) and Record Gender (RGNDR).
  - 4.7.5.2.1. The qualifying criteria will produce a set of SN formats to retrieve from the database.
  - 4.7.5.2.2. The delimiting criteria will specify the YOB range, maximum RC Level for each of the SN formats and Record Gender limitations, if any.

# 4.8. HISPANIC GIVEN NAME TYPE DATA STORE DECOMPOSITION

#### ·4.8.1. Identification

- 4.8.1.1. This data store is known as the Hispanic Given Name Type Data Store (HGT).
- 4.8.1.2. This data store could be merged with the High Frequency Given Name Variant Data Store (HFGV).
  - 4.8.1.2.1. The ID\_NO would be different in the HFGV and would serve as a unique identifier for each entry.
  - 4.8.1.2.2. The set of HFGN\_TYPEs, with no variants, would be derivable from the HFGN\_VARs with a DI\_VAL equal to 1.00.
  - 4.8.1.2.3. The SET\_ID of the HFGT and HFGV would be the same.

# 4.8.2. Type

- 4.8.2.1. The HGT data store will consist of up to ten thousand entries.
- 4.8.2.2. The HGT will be accessed by the Hispanic Gender Identifier, Frequency Path Director (FPD), the High Frequency Processor.
- 4.8.2.3. The HGT will have the following format:

Figure 61: Format: Hispanic Given Name Type Data Store (HGT)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE
ID_NO	integer	4	00009999
GN TYPE	character	. 24	alphabetics
SET_ID	integer	3	001999
HI_FREQ	integer	1	1, 0 (True, False)
GNDR	character	1	M, F, U

Figure 62: Example: Hispanic Given Name Type Data Store (HGT)

ID_NO	GN_TYPE	SET_ID_	HI_FREQ	GNDR
0001	JOSE	0001	1	M
0002	MARIA	0002	1	F
0003	JUAN	0003	l	M
0004	LUIS	0004	1	М
0005	ANTONIO	0005	l l	M
0006	CARLOS	0006	1	M
0007	JESUS	0007	l	M
0008	MANUEL	0008	1	M
0009	FRANCISCO	0009	1	M
0010	JORGE	0010	1	M
0011		0011		
2367	DAGOBERTO	0000	0	M

# 4.8.2.4. Definitions

- 4.8.2.4.1. ID\_NO: is an integer that is a unique numerical identifier for each of the GN\_TYPEs.
- 4.8.2.4.2. GN\_TYPE: is a a character string that represents one of up to ten thousand Hispanic given name stems.
  - 4.8.2.4.2.1. A HFGN\_TYPE is a GN\_TYPE whose HI\_FREQ value is 1 (True).
- 4.8.2.4.3. SET\_ID: is an integer that is the numerical identifier for the set of related variants of the GN\_TYPE that is HF.
  - 4.8.2.4.3.1. The SET\_ID will serve as the HFGN\_KEY.
  - 4.8.2.4.3.2. Not every entry in the HGT will have a unique SET\_ID; a distinct SET\_ID is reserved for those GN\_TYPEs where HI\_FREQ is True (1).
- 4.8.2.4.4. HI\_FREQ: is an integer (1, 0/True, False) that indicates if the GN\_TYPE is or is not a HF GN segment.
  - 4.8.2.4.4.1. The frequency of all GN\_TYPEs will be specified.
  - 4.8.2.4.4.2. True (1) will indicate a HF segment.
  - 4.8.2.4.4.3. False (0) will indicate a LF segment.
- 4.8.2.4.5. GNDR: is a single character value that indicates the gender of the GN\_TYPE.
  - 4.8.2.4.5.1. If the name is predictably female, the value will be
  - 4.8.2.4.5.2. If the name is predictably male, the value will be M.
  - 4.8.2.4.5.3. If the name is ambiguous or unknown, the value will be U.

# 4.8.3. Purpose

The HGT provides information about Hispanic given name segments. It indicates the frequency of the segments, their gender and the set of names of which they are the parent.

#### 4.8.4. Function

The HGT serves as a resource for Hispanic Gender Identifier and the High Frequency Processor.

# 4.9. HIGH FREQUENCY GIVEN NAME VARIANT DATA STORE DECOMPOSITION

#### 4.9.1. Identification

This data store is known as the High Frequency Given Name Variant Data Store (HFGV).

# 4.9.2. **Type**

- 4.9.2.1. The HFGV will be accessed by the High Frequency Processor.
- 4.9.2.2. The HFGV will have about 60,000 to 90,000 rows.
- 4.9.2.3. The HFGV will have the following format:

Figure 63: Format: High Frequency Given Name Variant Data Store (HFGV)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE
ID_NO	integer	5	0000099999
HFGN_VAR	character	24	alphabetics
SET_ID	integer	4	00009999
DI_VAL	decimal	4	0.001.00

Figure 64: Example: Piece of HFGV

ID_NO	HFGN_VAR	SET_ID	DI_VAL
00001	JOSE	1000	1.00
00002	JOSEA	0001	0.73
00003	JOSSE	0001	0.73
00004	MARIA	0002	1.00
00005	MIRIA	0002	0.67
00006	MIRIAM	0164	1.00
00007	MIRIA	0164	0.77

# 4.9.2.4. Definitions

- 4.9.2.4.1. ID\_NO: is a unique numerical identifier for each HFGN\_VAR entry in the HFGV data store.
- 4.9.2.4.2. HFGN\_VAR: is character string that represents a GN segment that is a digraph variant of the HFGN\_TYPE (HFGN\_VAR whose DI\_VAL = 1.00).
- 4.9.2.4.3. SET\_ID: is a unique identifier of the set of GN segments. that are variants of the same HFGN\_TYPE.
- 4.9.2.4.4. DI\_VAL: is a two-place decimal value that indicates the digraph relationship between the HFGN\_VAR and its parents HFGN\_TYPE.

# 4.9.3. Purpose

The HFGV is a resource for defining the given name segments that will be stored with records added to the database. Storage of information about variant relations will speed retrieval and the filtering process.

# 4.9.4. Function

The HFGV will be accessed by the HFP to assign keys to given name segments on record add and query.

4.10. LOW FREQUENCY SURNAME TYPE DATA STORE DECOMPOSITION

#### 4.10.1. Identification

This data store is known as the Low Frequency Surname Type Data Store (LFST).

# 4.10.2. Type

- 4.10.2.1. The LFST is a data store of LF keys.
- 4.10.2.2. The LFST will have about 900,000 to 1 million rows.
- 4.10.2.3. The LFST will have the following format:

Figure 65: Format: Low Frequency Surname Type Data Store (LFST)

DATA TYPE	FIELD SIZE	VALUE RANGE
integer	6	000001999999
character	24	alphabetics
character	3	alphanumerics; char + char + #
	integer character	integer 6 character 24

Figure 66: Example: Piece of LFST

ID_NO	LFSN_TYPE	LFDIKEY
000001	AALVAREZ	AAl
000001	AALVAREZ	AA2
000001	AALVAREZ	AL2
000001	AALVAREZ	ALI
000001	AALVAREZ	AL3
000001	AALVAREZ	LV3
000001	AALVAREZ	LV2
000001	AALVAREZ	LV4
000001	AALVAREZ	VA4
000001	AALVAREZ	VA3
000098	BARRIOS	BAI
000098	BARRIOS	BA2

# 4.10.2.4. Definitions:

- 4.10.2.4.1. ID\_NO: is an arbitrary numerical reference to each LFSN\_TYPE. The ID\_NO will serve as the DI\_KEY.
- 4.10.2.4.2. LFSN\_TYPE: is the unique low frequency name segment as it occurs in the database; if there are multiple occurrences of the same name, they are represented by one entry, hence the term "type."

- 4.10.2.4.3. LFDIKEY: is a string of alphanumeric characters that represents one digraph and its actual or derived position.
  - 4.10.2.4.3.1. Up to ten LFDIKEYs will be associated with each LFSN\_TYPE.
  - 4.10.2.4.3.2. An LFDIKEY is name-specific, so the same key may appear with other LFSN\_TYPEs, in which case it will have a different ID\_NO.

# 4.10.2.4.3.3. A LFDIKEY is

- a digraph formed from the LF SN segment beginning with the leftmost character and its position (Base Key) and
- 2) a positional variant on that digraph key (Position Key).
- 4.10.2.4.3.4. Positional information will be associated with each digraph.
- 4.10.2.4.3.5. To form a key, begin with the leftmost character and generate four digraph keys (Base Key) from the five leftmost characters of the LF SN segment. The first two characters form a digraph, the second and third characters form a digraph, the third and fourth characters form a digraph and the fourth and fifth characters form a digraph. Positional information (Positions 1, 2, 3, 4) will be included.
- 4.10.2.4.3.6. Generate, from the Base Keys, up to six additional Position Keys; the position keys have the same characters as the Base Keys but contain different positional information. A maximum of ten keys (Base + Position) will be generated.
  - 4.10.2.4.3.6.1. Produce a Position Key on the first Base Key with Position 2.
  - 4.10.2.4.3.6.2. Produce Position Keys on the second Base Key with Position 1 and Position 3.
  - 4.10.2.4.3.6.3. Produce Position Keys on the third Base Key with Position 2 and Position 4.
  - 4.10.2.4.3.6.4. Produce a Position Key on the fourth Base Key with Position 3. No Position Key is generated for Position 5 because the maximum of 10 keys has been reached.

### 4.10.3. Purpose

The LFST provides information that will limit the search of database records. - Preprocessing of name types allows identification of relevant name segments without having to examine database records directly.

#### 4.10.4. Function

The LFST will be accessed by the LFP.

# 4.11. HISPANIC CHARACTER DATA STORE

# 4.11.1. Identification

This data store is known as the Hispanic Character Data Store (HCD).

#### 4.11.2. Type

- 4.11.2.1. The HCD is a data store of all characters in Hispanic names and their predictable variants.
- 4.11.2.2. The format of the HCD will be:

Figure 67: Format: Hispanic Character Data Store (HCD)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE
SET_ID	integer	3	000999
CHAR	· character	1	alphabetics
CHAR VAR	character	1	alphabetics

Figure 68: Example: Piece of HCD

SET_ID	CHAR	CHAR_VAR
001	В	В
001	В	V
002	S	S
002	S	Z
004	С	С
004	С	S
037	F	F
052	K	K
078	M	M
078	М	N

#### 4.11.2.3. Definitions

- 4.11.2.3.1. SET\_ID: is an arbitrary numerical that represents the set of characters that vary with one another. The SET\_ID will be the GN\_INIT Key.
- 4.11.2.3.2. CHAR: is a single alphabetic character. Every alphabetic character will be représented. The CHAR is the type of

character, which may or may not have variants (CHAR\_VAR).

4.11.2.3.3. CHAR\_VAR: is a single alphabetic character that may or may not vary predictably with other characters in written Spanish. A single character may participate in more than one set

#### 4.11.3. Purpose

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Retrieval of records with HF SN segments from the database will be limited by the initial of the GN segments. For the retrieval to be sufficiently robust, however, the system must allow for some variation in the GN initials. The HCD indicates variations on initials.

# 4.11.4. Function

The HCD will be accessed by the HFP and will provide the source of the GN\_INIT Keys that are to be generated for HF searches.

# 4.12. TAQ FILTER DATA STORE DECOMPOSITION

#### 4.12.1. Identification

This data store is known as the TAQ Filter Data Store (TF).

# 4.12.2. Type

- 4.12.2.1. This TF will be accessed by the Hispanic Filter and Sorter and provides parameter factors for matching TAQ DISREGARD tags during record filtering.
- 4.12.2.2. The format of the TF follows:

Figure 69: Format: TAQ Filter Matrix Design

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
TAODIS#1	character	8	alphabetics	TAQ_DISREGARD ITEM
TAODIS#2	character	. 8	alphabetics	TAQ_DISREGARD ITEM
TF_VALUE	decimal	4	0.001.00	Various (TBD)

Figure 70: Example: Piece of TF (Values are for example only)

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TAQDIS#1	TAQDIS#2	TF_VALUE
DE	DE	1.00

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DE	DEL	0.90
DE	DE LOS	0.90
DE	LOS	0.75
DE	SAN	0.75
DE	LA	0.75
DEL	DEL	1.00
DEL	DE LOS	0.75
DEL	LOS	0.65
DEL	LA	0.85
DEL	SAN	0.50
DE LOS	DE LOS	1.00
DE LQS	LOS	0.90
DE LOS	SAN	0.50
DE LOS	LA	0.50
SAN	SAN	1.00
SAN	LOS	0.50
SAN	LA	0.50
LOS	LOS	1.00
LOS	LA	0.85
LA	LA	1.00

2.3.0

#### 4.12.2.3. Definitions

- 4.12.2.3.1. TAQDIS#1: is the TAQ DISREGARD segment that occurs in one or the other (different) of the comparands.
- 4.12.2.3.2. TAQDIS#2: is the TAQ DISREGARD segment that occurs in one or the other (different) of the comparands.
- 4.12.2.3.3. TF\_VALUE: is the factor that will be used to adjust the SN\_VAL or GN\_VAL if the TAQDIS#1 and TAQDIS#2 are present in the comparands.

#### 4.12.3. Purpose

Hispanic names often have peripheral name elements. Some of these make up a segment of the name, the TAQ values identified in the TF. Their relative value, however, varies. Some of them cannot cooccur, some have opposite meanings, so it is necessary to identify their relative value when they are contrasted with one another.

#### 4.12.4. Function

The TF provides the resources for the HFS to determine the relative value of TAQs that occur in two comparands.

4.13. HISPANIC PARAMETER DATA STORE DECOMPOSITION

#### 4.13.1. Identification

This module is known as the Hispanic Parameter Data Store (HPD).

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03/19/98

# 4.13.2. **Type**

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- 4.13.2.1. The HPD is a data store that will be accessed by the Filter Component of the Hispanic Filter and Sorter (HFS).
- 4.13.2.2. The HPD is a parameter table that will be accessible to the user and whose cell values will be determined through testing and comparative evaluation.
- 4.13.2.3. The HPD has the following format:

Figure 71. Format: Hispanic Parameter Data Store (HPD)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
PARM_NAME	character	6	alphabetics	SNTHR, GNTHR, OPSVAL, OPGVAL, INITSN, INITGN, RGNDR, TAQASN, TAQAGN, TAQXSN, TAQXGN, RL#, YOB#, COB#, etc.
PARM_VAL	decimal	4	0.001.99	Various (TBD)

Figure 72: Example: HPD (Values are for example only.)

PARM_NAME	PARM_VAL
SNTHR	0.60
GNTHR	0.65
LFDIKEY THRESHOLD	0.57

DI_VAL THRESHOLD	0.63
HFGV THRESHOLD	0.65
HFSV THRESHOLD	0.65
OPGVAL	0.60
OPSVAL	0.60
ASVAL	0.65
AGVAL	0.65
INITSN	0.85
INITGN	0.85
INITNM	0.80
RGNDR	0.65
TAOASN	0.90
TAQAGN	0.90
TAQXSN	0.85
TAQXGN	0.85
RL0	1.20
RL1	1.15
RL2	1.10
RL3	1.05
RL4	1.00
YOB0	1.30
YOB1	1.25
YOB2	1.20
YOB3	1.15
YOB4	1.10
YOB5	1.05
YOB6	1.00
COB1	1.20
COB2	1.15
COB3	1.10
COB4	1.00
COB5	0.95

4.13.2.4. The values provided are for example only and do not necessarily represent the PARM\_VALs to be used for the parameters.

#### 4.13.3. Purpose

The HPD is a data store that allows easy access to adjustable thresholds for record qualification, to thresholds for data store updates, and to parameters that contribute to the determination of the name scores (SN\_VAL, GN\_VAL) and to the Composite Score of two record comparands.

# 4.13.4. Function

The HP functions as an independent data store with thresholds needed by the LFP and all the parameters needed by the HFS during the filtering process.

# 4.14. REFUSAL CODE CATEGORY DATA STORE DECOMPOSITION

#### 4.14.1. Identification

This data store is known as the Refusal Code Level Data Store (RCL).

#### 4.14.2. Type

- 4.14.2.1. It is recommended that the RCL be a parameter file, which can be accessed by the client so RC categories can be added to or changed with
- 4.14.2.2. The RC data store will provide a list of the Refusal Codes and its Refusal Category, which is an indication of the level of seriousness of each Refusal Code.
- 4.14.2.3. The RCL will be referred to by the Hispanic Decision Matrix (HDM) and by the LFP and Hispanic Filter and Sorter.
- 4.14.2.4. The RCL has the following format:

Figure 73: Format: Refusal Code Level Data Store (RCL)

DATA FIELD	DATA TYPE	FIELD SIZE	DATA VALUE
REFUSAL CODE	alphanumerics	3	Standard Refusal Codes
REF_CAT	alphanumerics	3	RL0, RL1, RL2, RL3, RL4

Figure 74: Example: RCL (REF\_CATs for example only)

REFUSAL CODE	REF_CAT
00	RL0
23	RLi
6C	RL2
07	RL3
G	RL4

# 4.14.2.5. Definitions

- 4.14.2.5.1. REFUSAL CODE: indicates each Visa Refusal Code (Codes and their Refusal Level (see VALUE) are for example only; they do not represent the complete list nor the accurate assignment of a Refusal Code to a Refusal Level).
- 4.14.2.5.2. REF\_CAT: The RL# will appear in the form RL1, RL2,
  - 4.14.2.5.2.1. RL# is the Refusal Category to which a particular Refusal Code has been assigned. The Visa Office will assign Refusal Codes to one of 4 categories: RL1, RL2, RL3, RL4; RL0 is reserved for the Refusal Code 00. (The current distinction among Refusal Codes is a binary one: serious and non-serious. Assignment of Refusal Codes to more groups has not yet been done; the consequence is that one or more of these categories may not currently have a distinct value.) The RL# occurs in ascending order, from most serious to least serious Refusal Code. The RL# will be linked to a Year-of-

Birth Code (see Section 4.16) to determine the relevant subsets of records to be searched.

- 4.14.2.5.2.2. RC0 refers to the Refusal Code 00
- 4.14.2.5.2.3. RC1 refers to all Refusal Codes that have been designated as Type 1 Serious RC 1, i.e., the most serious, excluding 00.
- 4.14.2.5.2.4. RC2 refers to all Refusal Codes that have been designated as Type 2 Serious RC, i.e., serious but less serious than RC0 and RC1.
- 4.14.2.5.2.5. RC3 refers to all Refusal Codes that have been designated as Type 1 Non-Serious RC. These codes are less serious than the RC0, RC1 and RC2 codes.
- 4.14.2.5.2.6. RC4 refers to Refusal Codes that have been designated as Type 2 Non-Serious. These codes are the least serious codes, less serious than the RC0, RC1, RC2 and RC3 codes.

### 4.14.3. Purpose

It has long been desirable to make more granular distinctions among the Refusal Codes. For many years, DOS has maintained a distinction between serious and non-serious codes; these different categories were correlated with different YOB search ranges. However, a mechanism for making greater distinctions will provide greater flexibility in delimiting the set to be retrieved during the first stage of record analysis, especially for Hispanic high frequency names, where more restricted retrievals are highly desirable. The introduction of five refusal code levels also provides the opportunity to correlate more year-of-birth ranges to the refusal code levels.

#### 4.14.4. Function

The RCL provides information needed for the evaluation of record proximity in the Hispanic filtering process and contributes to the delimitation of database records retrieved through the RLYOB Data Store.

# 4.15. YEAR-OF-BIRTH RANGE DATA STORE DECOMPOSITION

# 4.15.1. Identification

This data store is known as the Year-of-Birth Range Data Store (YR).

# 4.15.2. Type

- 4.15.2.1. It is recommended that the YR be a parameter file, which can be accessed by the client so YOB ranges can be set. Alternatively, it could be represented as a system parameter whose value(s) are set in an .ini file
- 4.15.2.2. The YR will define the YOB ranges that will be associated with a Refusal Level (see Section 4.16).
- 4.15.2.3. This data store has the following format:

Figure 75: Format: Year-of-Birth Range Data Store (YR)

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE	DATA DEFINITION
YOB0	integer	1	0	exact date of birth
YOB1	character	1	Α	exact year, inverted month and day
YOB2	character	l	В	exact year of birth
YOB3	integer	2	199	narrow year of birth range
YOB4	integer	2	199	standard year of birth range
YOB5	integer	2	199	wide year of birth range
YOB6	integer	2	199	unlimited year of birth range

# 4.15.2.4. Definitions

- 4.15.2.4.1. YOB# is the Year-of-Birth Range category whose value indicates the year-of-birth range to be searched. The year-of-birth VALUE indicates the search range, that is, the number of years on either side of a given year-of-birth to be searched. For example, if the input year is 1962 and YOB3 range is 4, the search will cover a range of nine years, 1958-1966. The range includes the full year, so all of 1958 and all of 1966.
  - 4.15.2.4.1.1. There are seven YOB# categories, YOB0, YOB1, YOB2, YOB3, YOB 4, YOB5, YOB6.
    - YOB0 is a single integer that refers to an exact month, day, year of birth. If YOB0 is specified, the system must be able to match the month, day and year of the Date of Birth of an input record and a database record.
    - YOB1 is a single character (A) that refers to an exact year-of-birth with the month and day inverted.
      - If YOB1 is specified, the system must be able to match the year of Date of Birth and an inverted month and day (DEC 03 → MAR 12) of the input record and the database record.
      - YOB1 will be relevant to the Hispanic Filter and Sorter, but may not function as a search

parameter since the value would be subsumed in YOB2.

- YOB2 is a single character (B) that refers to an exact year-of-birth. If YOB2 is specified, the system must be able to match the year of the Dateof-Birth of an input record and a database record.
- YOB3 is a one- or two-place integer (1...99) that refers to a narrow year-of-birth range. Narrow yearof-birth range is usually defined as 1 year (for a search range of 3 years).
- YOB4 is one- or two-place integer (1...99) that refers to a standard year-of-birth range. Standard year-of-birth range is usually defined as 3 years (for a search range of 7 years).
- YOB5 is a one- or two-place integer (1...99) that refers to a wide year-of-birth range. Wide year-ofbirth range is usually defined as 5 years (for a search range of 11 years).
- YOB6 is a one- or two-place integer (1...99) that refers to an unlimited or extremely wide year-ofbirth range. Unlimited year-of-birth range would be set sufficiently high to include all (or all desired) years-of-birth in the database (e.g., 50).

#### 4.15.3. Purpose

This YR provides a greater granularity in the year-of-birth range and, therefore, greater flexibility in delimiting the set to be retrieved during the first stage of record analysis. The correlation of five refusal code levels to different year-of-birth ranges will help to delimit the number of records to be searched and to define the more valuable set of records. For the Hispanic processor, greater precision in the year-of-birth range is especially important in the High Frequency Processor where more restricted retrievals are highly desirable.

## 4.15.4. Function

- 4.15.4.1. The YR permits greater granularity in the Date-of-Birth types related to the system.
- 4.15.4.2. The YR will be accessed by the Refusal Code Level/YOB Range Data Store, which will limit the retrieval range in the Hispanic Search Engine.
- 4.15.4.3. The YR data store will define the YOB ranges referred to in the Hispanic Decision Matrix (HDM).
- 4.15.4.4. The YR will contribute to the Hispanic Filter and Sorter to contribute information to the composite score.

# 4.16. REFUSAL CODE LEVEL / YOB RANGE DATA STORE MODULE DECOMPOSITION

#### 4.16.1. Identification \_\_\_\_

This data store is known as the Refusal Code Level/YOB Range Data Store (RLYOB).

# 4.16.2. **Type**

- 4.16.2.1. The RLYOB is a matrix that merges the values in the Refusal Code Level (RCL) Data Store and the Year-of-Birth Range (YR) Data Store.
- 4.16.2.2. For each Refusal Level (RL), a Year-of-Birth (YOB) Range is specified.
  - 4.16.2.2.1. Only one YOB Range for each RL is permitted.
  - 4.16.2.2.2. The same YOB Range may apply to more than one RL.
- 4.16.2.3. The RLYOB has the following format:

Figure 76: Format: Refusal Level/Year-of-Birth Range Data Store (RLYOB)

-[	DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
- [	RL#	character	3	RL04	RL0, RL1, RL2, RL3, RL4
	YOB#	character	4	YOB06	YOBO, YOB1, YOB2, YOB3, YOB4, YOB5, YOB

Figure 77: Example: RLYOB Data Store

RL#	YOB#
RL0	YOB5
RLI	YOB4
RL2	YOB3
RL3	YOB3
RL4	YOB2

#### 4.16.2.4. Definitions:

- 4.16.2.5. RL#: is a character string that indicates the Refusal Level of the Refusal Code.
- 4.16.2.6. YOB#: is a character string that indicates the Date-of-Birth Range Category of the comparands.

#### 4.16.3. Purpose

Retrieval of records from the database should be delimited by a relationship between the Refusal Code Level and the Year-of-Birth Range. It will restrict the number of records to be reviewed.

#### 4.16.4. Function

The RLYOB is a resource for the Hispanic Search Engine to delimit the LF records retrieved from the database.

# 4.17. COUNTRY-OF-BIRTH PROXIMITY DATA STORE

# 4.17.1. Identification

This module is known as the Country-of-Birth Proximity Data Store (COBPROX).

# 4.17.2. **Type**

4.17.2.1. The COBPROX is a data store whose cells contain a decimal value that reflects the degree of relationship between the country represented on two country-of-birth.

4.17.2.2. The COBPROX has the following format:

Figure 78: Design: COBPROX Data Store

DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
COB#1	character	4	alphabetics	COB Code
COB#2	character	4	alphabetics	COB Code
COBVAL	decimal	4	0.001.00	Various

Figure 79: Example: Piece of COBPROX Data Store (COBVAL for example only)

000011	CODILLI	
COB#1	COB#2	COBVAL
AGS	AGS	1.00
AGS	GRBR	0.05
AGS	VTNM	0.05
AGS	MORO	. 0.05
AGS	SYR	0.05
ALG	ALG	1.00
ALG	MORO	0.85
ALG	GRBR	0.05
ALG	VTNM	0.05
MORO	MORO	1.00
MORO	GRBR	0.05
MORO	VTNM	0.05
GRBR	GRBR	1.00
GRBR	VTNM	0.05
VTNM	VTNM	1.00

#### 4.17.2.3. Definitions:

- 4.17.2.3.1. COB#1: is the 4-character Country-of-Birth Code of one of the comparands.
- 4.17.2.3.2. COB#2: is the 4-character Country-of-Birth Code of one of the comparands.
- 4.17.2.3.3. COBVAL: is the decimal value assigned through the HCOB and other COB Category Data Stores that are culture-specific (as they are developed). A default value will be assigned for those COBs that do not enter into special relations. The COBVAL indicates the degree of relationship between the two COBs.

#### - ·4.17.3. Purpose

The COBPROX Data Store provides information on the relative value of the COBs in two comparands. This value can serve to limit the COBs that are accessed for retrieval.

#### 4.17.4. Function

The COBPROX is populated by the HCOB and any other partition-specific Country-of-Birth Category Data Stores. The COBPROX provides COB relationship information.

# 4.18. HISPANIC COUNTRY-OF-BIRTH CATEGORY DATA STORE DECOMPOSTION

#### 4.18.1. Identification

This data store is known as the Hispanic Country-of-Birth Category Data Store (HCOB).

#### 4.18.2. Type

This HCOB is a data store that will serve as the source of information for the COBPROX Data Store, populating the COBVAL, and will provide the COB Category (COBCAT) necessary for the Hispanic Filter and Sorter.

Figure 80: Design: Hispanic Country-of-Birth Category Data Store (HCOB)

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DATA FIELD	DATA TYPE	FIELD SIZE	VALUE RANGE	DATA VALUE
COB#1	characters	4	alphabetics	COB Code
COB#1	characters	4	alphabetics	COB Code
COBCAT	characters	5	alphanumberics	COB1COB99
COBVAL	decimal	4	0.001.00	Various

Figure 81: Example: Piece of HCOB (Values for example only.)

COB#1	COB#2	COBCAT	COBVAL
AGS	AGS	COB1	1.00
AGS	MEX	COB2	0.95
AGS	COL	COB4	0.65
AGS	VENE	COB4	0.65

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AGS	PORT	COB5	0.60
COL	COL	COB1	1.00
COL	MEX	COB4	0.65
COL	VENE	COB3	0.85
COL	PORT	COB5	0.60
MEX	MEX	COB1	1.00
MEX	VENE	COB4	0.65
MEX	PORT	COB5	0.60
VENE	VENE	COB1	1.00
VENE	PORT	COB5	0.60
PORT	PORT	COB1	1.00

# 4.18.3. Definitions

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- 4.18.3.1. COB#1: is the 4-character COB Code of one of the comparands.
- 4.18.3.2. COB#2: is the 4-character COB Code of one of the comparands.
- 4.18.3.3. COBCAT: is the category assigned to the relationship of two COBs.
  - 4.18.3.3.1. Categories might be defined as Exact, State, Geographic Region, Dialect Region.
  - 4.18.3.3.2. All relationships are adjustable.
  - 4.18.3.3.3. Example COB Categories are:
    - COB1: Exact represents an exact match of the COBs: AGS/AGS; the COBPROXVAL would be 1.00.
    - COB2: State Relationship represents the set of COBs that are states within one country (currently only the Mexican States qualify). The score would be something less than that applied to an exact match but nonetheless high: 0.95.
    - COB3: Northern South America represents the set of COBs that are in close geographic proximity and share naming conventions: COL/VENE. The value assigned would be less than that for COB2: 0.85.
    - COB4: All Latin America refers to all COBs in Central and South America and the Spanish-speaking Caribbean. The value assigned would be less than that for COB2: 0.65.
    - COB5: Similar refers to COBs that have qualified as Hispanic but may not exhibit Hispanic naming conventions: Brazil, Portugal.
    - COB6: All refers to all COBs and is assigned a value that will allow the search of all COBs; it would be the lowest decimal value used.

4.18.3.4. COBVAL: is the decimal value that will be assigned to a particular COB relationship; this value will be used to determine the COBs that will be permitted in the retrieval process.

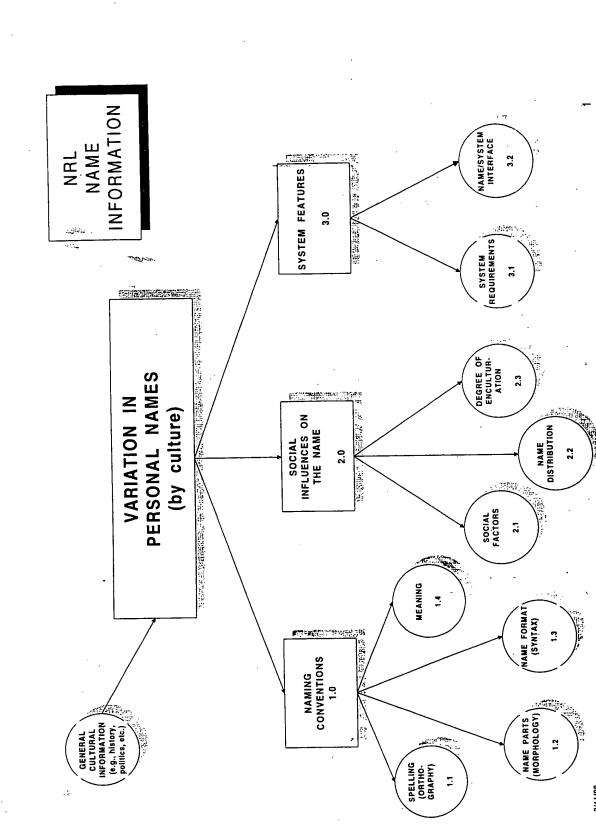
# 4.18.4. Purpose

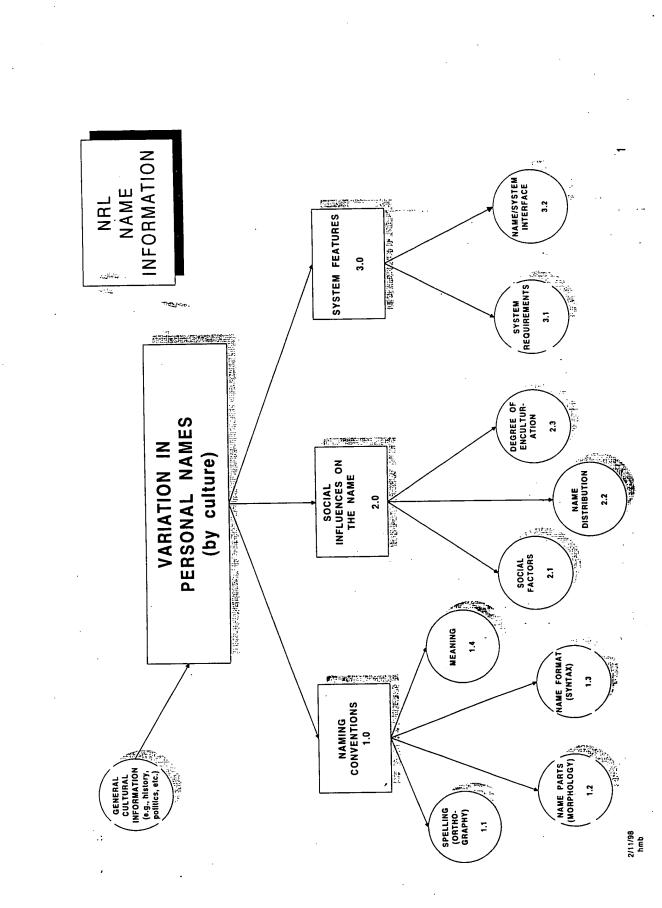
Pre-defined COB category relationships will provide a definition of the values that appear in the COBPROX Data Store.

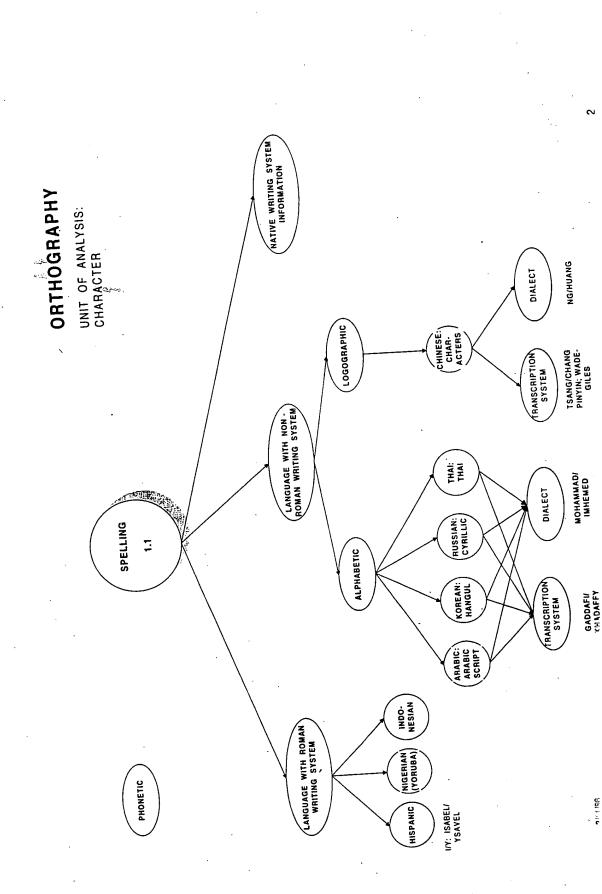
#### 4.18.5. Function

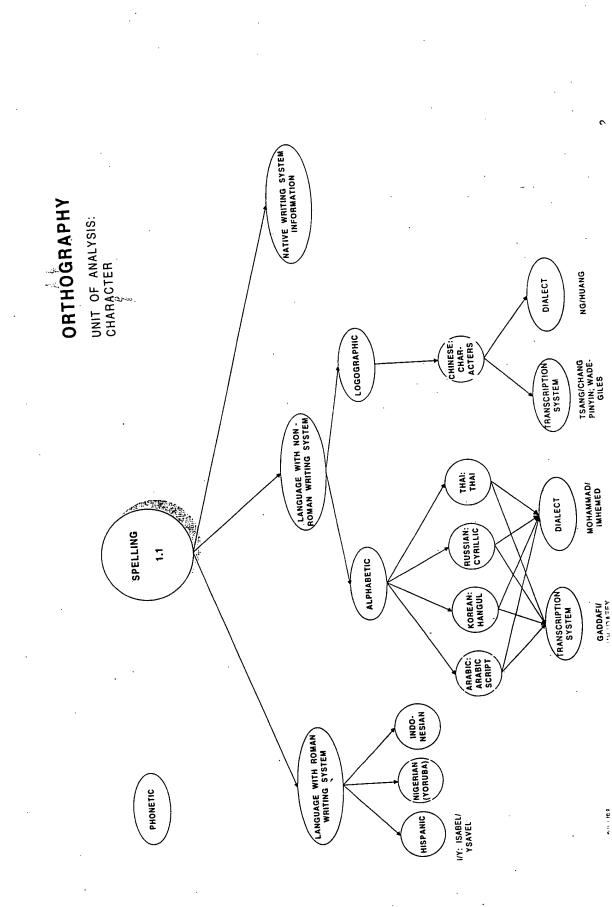
These COB categories will provide information about COB relationships that will contribute to determination of the Composite Score in the Arabic Filter and Sorter.

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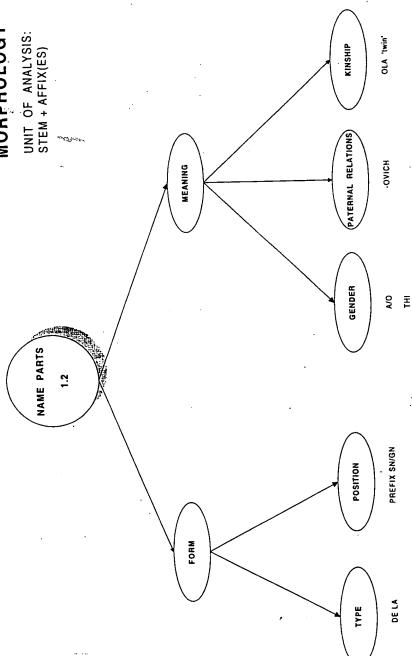


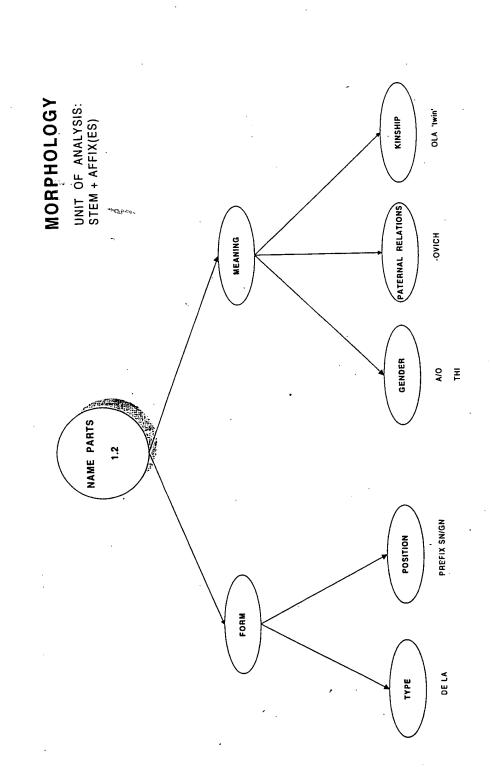




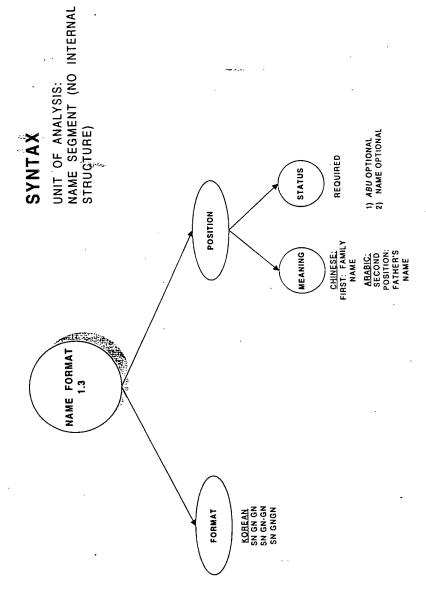


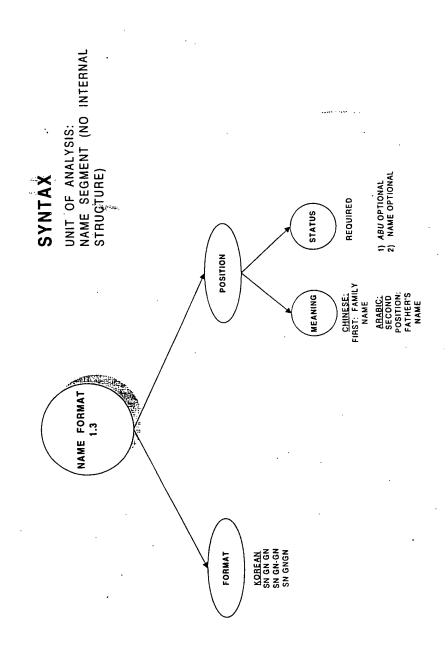


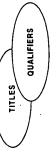




LAS 8/15/97 hmb

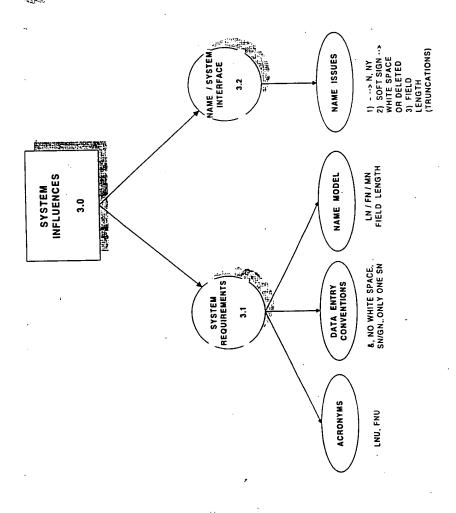


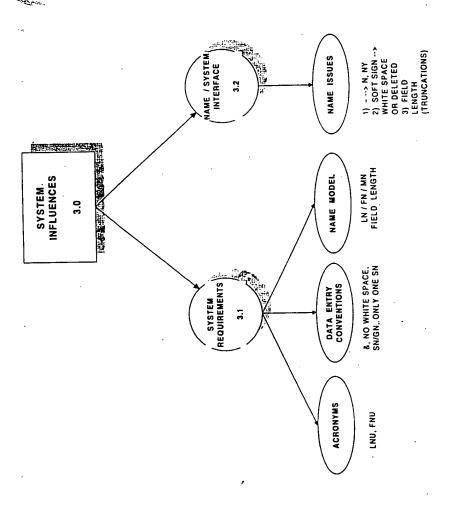




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U.S. Department of State Bureau of Consular Affairs Consular Lookout and Support System-Enhanced (CLASS-E)



Presentation to CA / EX / CSD

Advanced Name Classifier for CLASS-E (ANC-E)

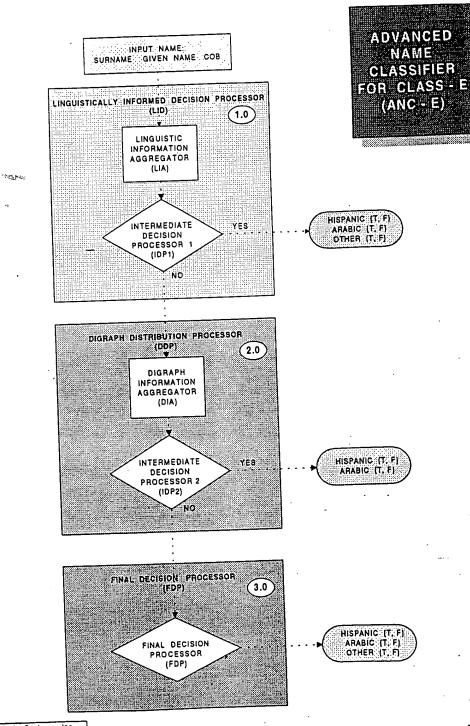
and

Hispanic Name Search Algorithm for CLASS-E (HNA-E)

September 18, 1997

Language Analysis Systems, Inc. 2214 Rock Hill Road—Hemdon, VA—20170

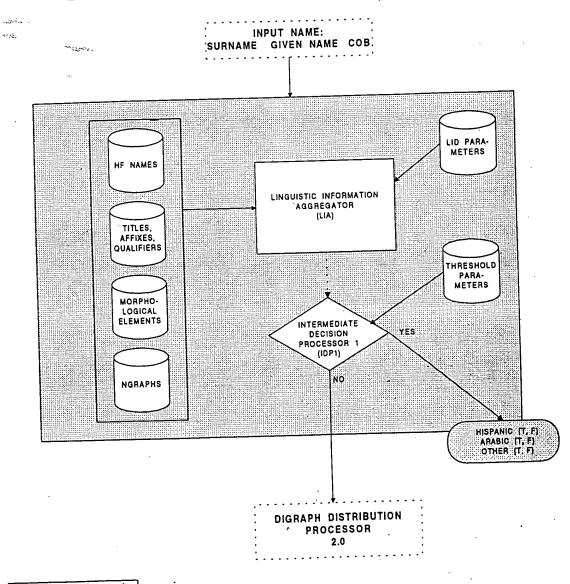




Language Analysis Systems, Inc. hmb 9/18/97 CA/EX/CSD Presentation

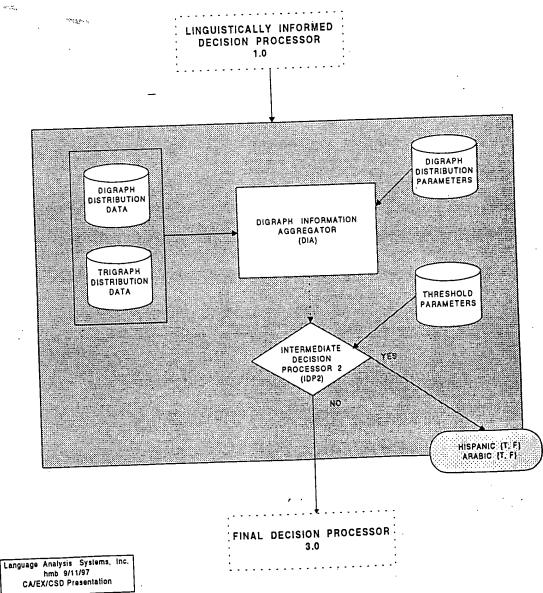
. مانازند

### LINGUISTICALLY INFORMED DECISION PROCESSOR (LID)

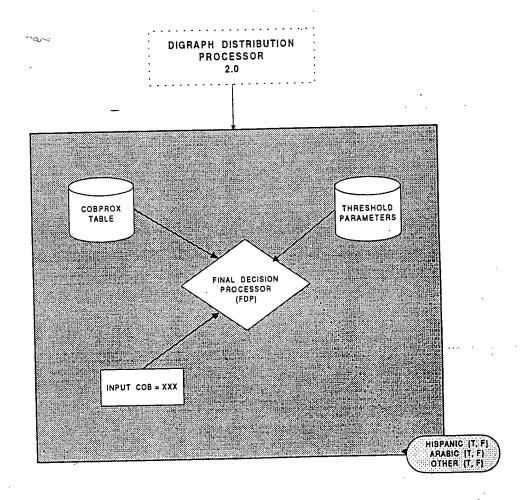


Language Analysis Systems, Inc. hmb 9/11/97 CA/EX/CSD Presentation

### DIGRAPH DISTRIBUTION PROCESSOR (DDP)



### FINAL DECISION PROCESSOR (FDP)



Language Analysis Systems, Inc. hmb 9/16/97 CA/EX/CSD Presentation

# ADVANCED NAME CLASSIFIER (ANC-E) EXAMPLE

# LINGUISTICALLY INFORMED DECISION PROCESSOR (LID)

	OutField: 8	<b></b>	OutField: 6	OutField: 6	O r o	OutFieldSN: 3 In FieldGN: 4 OutFieldGN: 2		9 <del>2</del> 9	OutFieldSN: 2 In FieldGN: 2 OutFieldGN: 1		ರೆ-5	OutFieldSN: 3 In FieldGN: 4 OutFieldGN: 2	w 4 4
1	[3	1	Tich Deciments	2		Prefixes	Γ	L	N-Grams	Γ	Σ	Morphology	
High Fred	High Frequency SN		Total	7-	У. Н	g	E	H	-ndez	<u></u>	٧	adin	3
3 2 E	Carcia	5   C	Francisco 2	Ţ.	ı H	٩	F	H	-guez	2	A S	eddin	7
H S	Salazar 2	o (c		<u>.</u>	: 3	<u>.</u>	E	E	읡	Ξ	٧	nddin	П
ES H	Sambrano 1	5		<u>.</u>	: 0		Ŀ	c	١	5	0	efto	2
0 5 0	Greco 5	0 8	Luigi	٦]		-	1			ŀ	S	ij	尸
O B	Giuliano 2	90	Antonio	7	0	ฮ	3	5		1			45
0	Cilverti	0	Adalberto	<u> -</u>	0 B	으	_	0	-agio	=	<u>2</u>	2	긔

## DELGADILLO DE GARCIA, JOSE ANTONIO

20 0 27	٠,
II II II	
JOSE (8*3)	Other 56
GARCIA (10*3)	LID_Threshold: Hispanic 65; Arabic 57; Other 56 Hispanic: F; Arabic: F; Other: F (N.B. Values for illustration only.)
DE (5*1)	_Threshold: H Hispanic: (N.B. Val
ANTONIO	<b>din</b>
-1LLO (3*1) - (3*3)	भ <sup>ा</sup> चिह्न ह <sub>ै</sub>
Hispanic: Arabic: Other:	

Language Analysis Systems, Inc 09/17/97

## DIGRAPH DISTRIBUTION PROCESSOR (DDP)

## DELGADILLO DE GARCIA, JOSE ANTONIO

						_
APHS	-1.0422	22.8733	38.7221	1.0572	42.5947	16.1242
DIG	团	Ę	BD	BD	EZ	RI
L	⋖	<	٧	Ξ	Ξ	Ξ

			_			_
	6	_	_	2	1	2
S	8	1.174	.455	177	.532	124
APH	7	-48	48	.3	4	=
	-	-			-	╘
F	Ē	ž	80	æ	B	¥
	<b>▼</b>	~	~	Ξ	Ξ	Ξ
_	L_	1	<u> </u>	<u> </u>		_

Digraph/Trigraph Scores:

44.2331 HISPANIC: ARABIC: DI\_Threshold: Hispanic 45.1116; Arabic 1.4532 Hispanic: F; Arabic: F

## FINAL DECISION PROCESSOR (FDP)

## DELGADILLO DE GARCIA, JOSE ANTONIO COB = COL

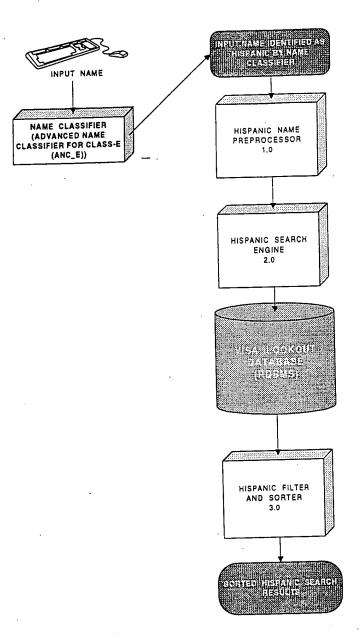
COB2	COL	VENE	BOL	EGYP	UAE
PART	Н	H	Н	Y	. Υ
COB	TOO	TOO	COF	EGYP	EGYP

UNDER\_DI\_THRESHOLD: Hispanic 5; Arabic 10 UNDER\_LID\_THRESHOLD: Hispanic 6; Arabic 8; Other 3

HISPANIC > YES UNDER\_DI\_THRESHOLD - yes UNDER\_LD\_THRESHOLD - yes COB-H ARABIC → NO UNDER\_DI\_THRESHOLD - no UNDER\_LID\_THRESHOLD - no COB-H OTHER → NO UNDER\_LID\_THRESHOLD - no COB - H

### ADVANCED HISPANIC NAME SEARCH ALGORITHM for CLASS - E (HNA-E)

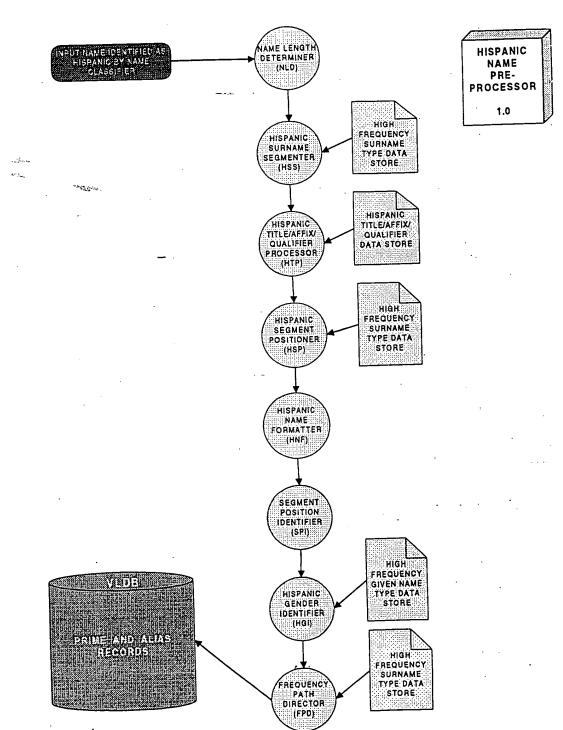
### PROCESS FLOW



Language Analysis Systems, Inc. HNA-E hmb 5/30/97 W

erenter.

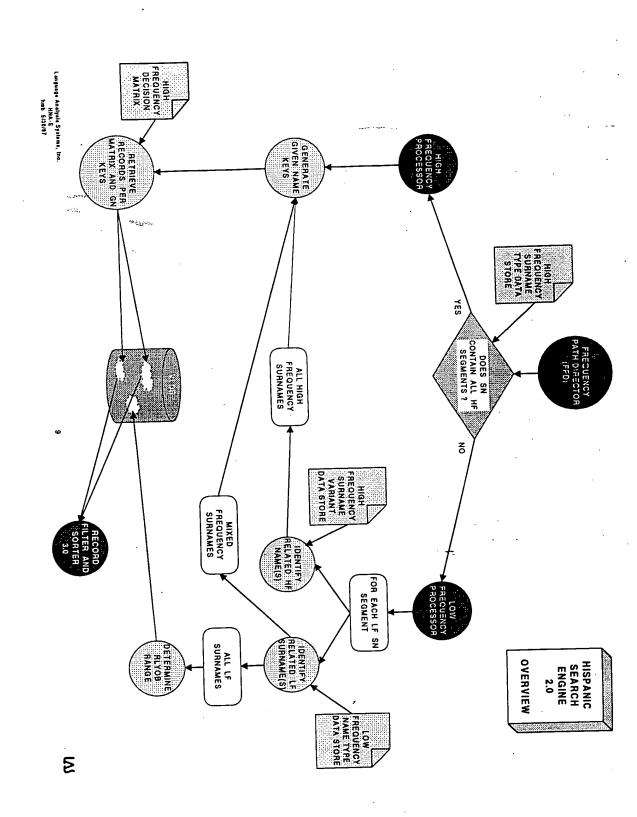
Sec. 17.

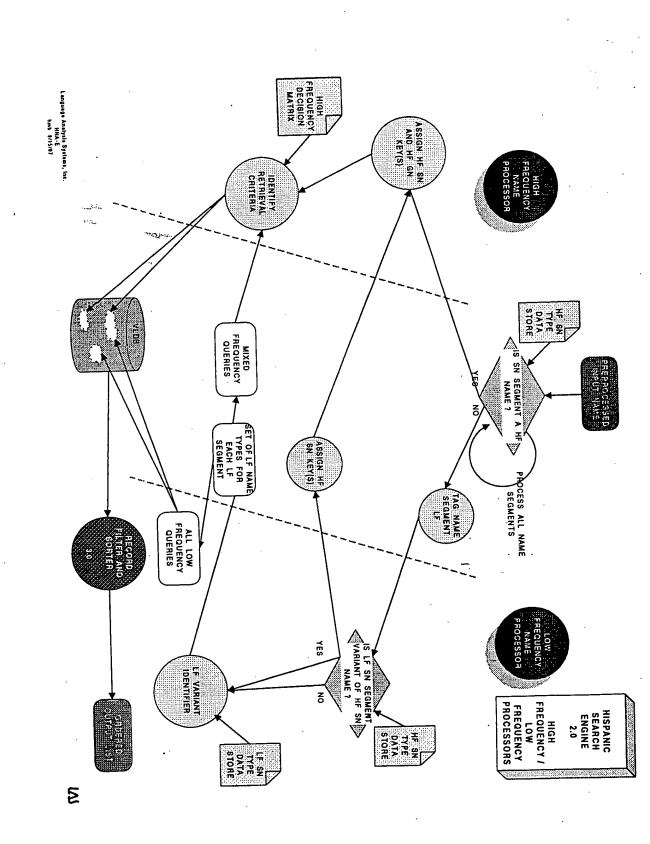


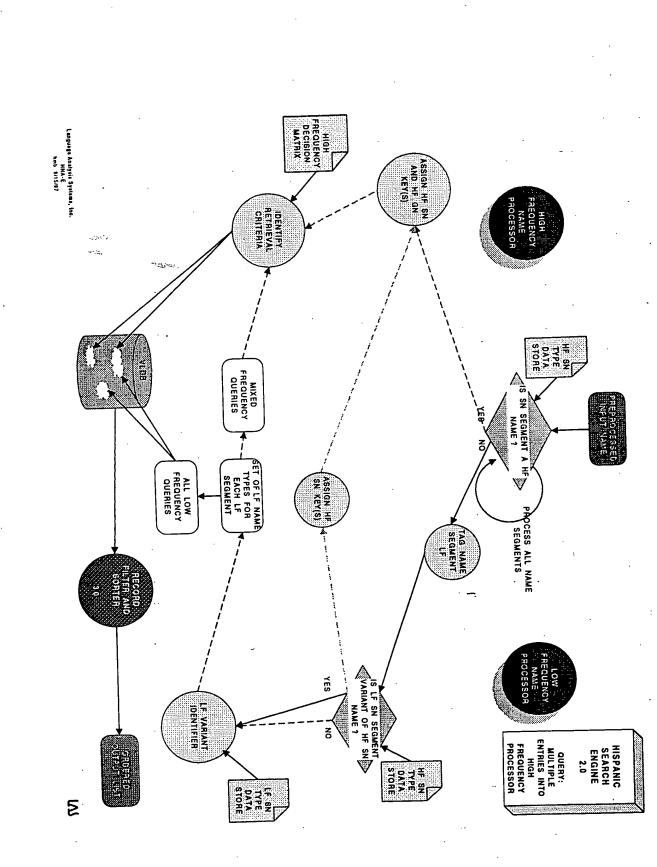
8

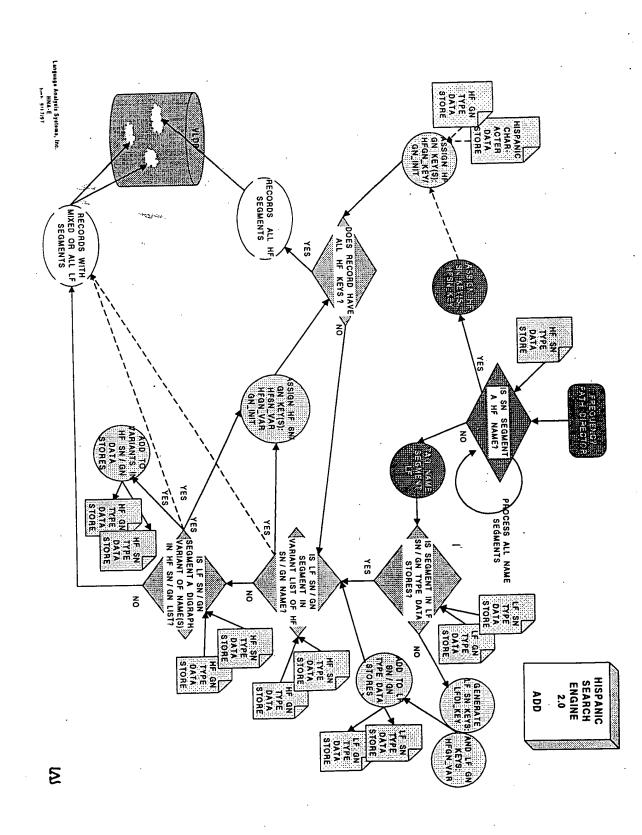
Language Analysis Systems, Inc.

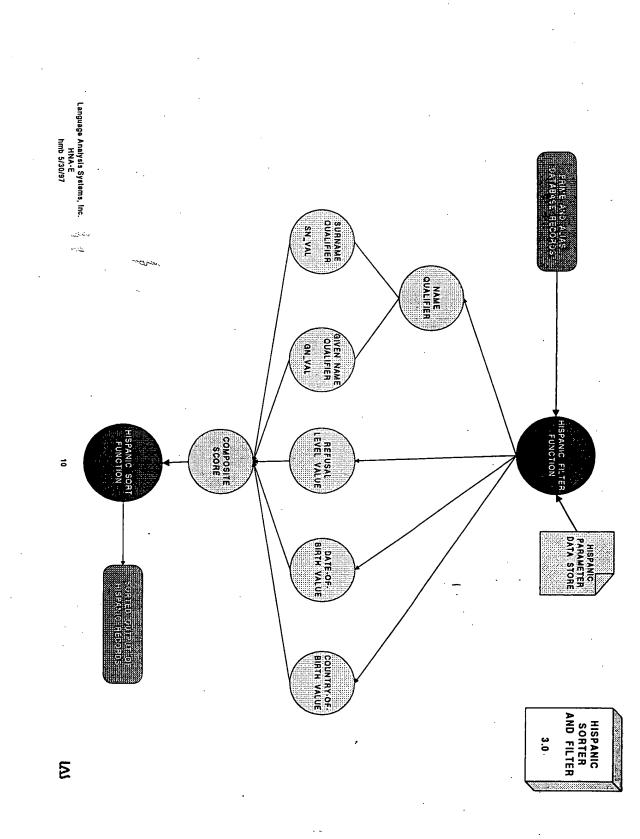
HNA-E hmb 5/30/97 LAS











# HISPANIC NAMESEARCH ALGORITHM FOR CLASS-E (HNA-E)

### FREQUENCY PATH DIRECTOR

- FPD directs record based on frequency of SURNAME data only
- ALL surnames must be HFSN\_TYPEs for record to go directly to HF Processor
   FDP assigns HFSN\_KEY (SET\_ID in HFST) to each high frequency surname

(Sample)	BOMEZ PEREZ, JOSE WILLIAM 0007	LOW FREQUENCY PROCESSOR
SST Data Store  SET 10  0001  0003  0003  0006  0006  0009  0009  0009	BOMEZ	
High Frequency Surname Type (HFST) Data Store (Sample)           ID NO         HESN TYPE         SET ID           0001         GARCIA         0001           0002         RODRIGUEZ         0002           0003         HERNANDEZ         0004           0004         LOPEZ         0004           0005         MARTINEZ         0005           0007         PEREZ         0006           0007         PEREZ         0009           0008         SANCHEZ         0009           0010         GOMEZ         0010           0011          0011	O JESUS	·
High Frequence	GARCIA LOPEZ, ANTONIO JESUS	HIGH FREQUENCY PROCESSOR

3

## HIGH FREQUENCY PROCESSOR

• High Frequency Processor assigns HFGN\_KEY (SET\_ID in HGT) to each High Frequency Given Name

_													_
(Sample	GNDR	Σ	<u>.</u> .	Σ	×	Σ	Σ	Σ	Σ	Σ	Σ		Σ
Data Store	HI FREQ	1	-	_	-	-	1	-	-	-	-		0
(HGT)	SET ID	1000	000	0003	9004	0000	9000	0000	8000	6000	0100	1100	0000
Hisnanic Given Name Type	GN TYPE	JOSE	MARIA	JUAN	LUIS	ANTONIO	CARLOS	JESUS	MANUEL	FRANCISCO	JORGE	:	DAGOBERTO
lispanic Giv	ON CI	ioc	0005	0003	900	9000	9000	2000	8000	6000	0100	1100	7367
Ξ	-												

GARCIA LOPEZ, ANTONIO JESUS 0001 0004 0005 0007

IF ALL NAME SEGMENTS HAVE BEEN ASSIGNED HFSN\_KEYS AND HFGN\_KEYS, THE HFP MATRIX ACCESSES THE ALL NAME SEGMENTS HAVE BEEN ASSIGNED HFSN\_KEYS AND HFGN\_KEYS, THE HFP MATRIX

## · HFP accesses Hispanic Decision Matrix for additional search criteria

Hispanic Decision Matrix (HDM) (Sample)

TIISDAIL AIREANNA	2	IISpaille Decision made (11211)	10101				( (	į				
	Singl	Single-Segment SN	t SN					Two-Segment SN	ent SN			
OUERY SN FORMAT	<	V V V I	Γ.		_	ΑB	`	AB	PΡ	AB	AB	AB
DATABASE SN FORMATS	<	ΑB	BA	-	DA B A BA A	BA	٧	В		85 5	æ	BC
YR#	~	S	5 . 2	_	2	4	4	2	2	0	0	0
RL#	4	4	9	-	4	4	4	1	1	0	0	0
RGNDR	MF	MFU	MFU	_	ΣE	MF	MFU	MF	5	MF	MF	ΑF
						>		>		<b>-</b>	ם	<b>-</b>

### GARCIA LOPEZ, ANTONIO JESUS

ıld be retrieved:									
retrieval criteria wou	RGNDR	MFU	MFU	MFU	MFU	FU	MFU	MFU	MFU
s and	RL#	4	4	4	4	-	-	0	٥
surname	YR#	S	7	4	4	2	2	0	°
For example, records with following sumames and retrieval criteria would be retrieved:	NAME	GARCIA LOPEZ	LOPEZ GARCIA	GARCIA	LOPEZ	GARCIA MARTIN	MARTIN. GARCIA	MARTIN* LOPEZ	LOPEZ MARTIN*
For example,	•								

\* Any SN segment

SEND TO HISPANIC SEARCH ENGINE
All HFSN\_KEYS
All HFGN\_KEYS
All Search Criteria

\*HISPANIC SEARCH ENGINE WILL RETRIEVE

AN EXACT MATCH AND

ALL RECORDS WITH SN KEYS WITH RETRIEVAL CRITERIA AND AT LEAST ONE HFGN\_KEY

## LOW FREQUENCY PROCESSOR

### (1) High Frequency Access

LFP determines if LF SN is variant of HF SN
 LFP assigns HFSN\_VAR keys (ID\_NO in HFSV) to SN that is variant of High Frequency Surname

 High Frequency Surname Variant (HFSV) Data Store (Sample)

 ID NO
 HFSN VAR
 SET ID
 DI\_VAL

 032711
 PEREZ
 0007
 1.00

 032712
 PEREZ
 0007
 0.67

 013713
 PEREZA
 0007
 0.67

 016976
 GOMES
 0010
 1.00

 016977
 GOMES
 0010
 0.67

 016978
 BOMEZ
 0010
 0.67

BOMEZ PEREZ, JOSE DAGOBERTO 0007 016978 LFP SENDS NAME WITH ALL HFSN\_KEYs and HFSN\_VAR KEYS TO HFP

• HFP WILL GENERATE GIVEN NAME KEYS

• HFP WILL IDENTIFY SEARCH CRITERIA IN HISPANIC DECISION MATRIX

## (ADDITIONAL) GIVEN NAME KEYS

9.1	7	_	_	_	Ť	_	7	_	7		T	_
GNDR	Σ	Ŀ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ		Σ
HI FREQ	-	_	_	-	1	_	-	_	-	-		0
SET_ID	1000	0002	0003	4000	5000	9000	7000	8000	6000	00100	100	0000
GN TYPE	JOSE	MARIA	JUAN	TUIS	ANTONIO	CARLOS	JESUS	MANUEL	FRANCISCO	JORGE		DAGOBERTO
ON QI	1000	0005	9003	9004	\$000	9000	0000	8000	6000	00100	1100	2367
	GN TYPE SET ID HI	1D_NO	1D NO   GN TYPE   SET_ID   H_FREQ   GNDR   O001   M   M   O002     F   O002     F   O002     F   O002     F   O002     F   O002     F   O002     F   O002     F   O002     F   O002     F   O002     O002     F   O002     O002     O002     O002     O002     O002	1D NO   GN_TYPE   SET_ID   HI_FREQ   GNDR     0001   JOSE   0001   M     0002   MARIA   0002   F     0003   JUAN   0003   I   M	1D_NO   GN_TYPE   SET_ID   HI_FREQ GNDR     0001   JOSE   0001   1 M     0002   MARIA   0002   1 F     0004   LUIS   0004   1 M	1D NO   GN_TYPE   SET_ID   H_FREQ   GNDR     0001   JOSE   0001   1 M     0002   MARIA   0002   1 F     0003   JUAN   0003   1 M     0004   LJIS   0004   1 M     0005   ANTONIO   0005   1 M	1D NO   GN_TYPE   SET_ID   H_FREQ   GNDR     0001   JOSE   0001   1 M     0002   MARIA   0002   1 F     0003   JUAN   0003   1 M     0004   LUIS   0004   1 M     0006   CARLOS   0005   1 M	1D NO   GN_TYPE   SET_ID   HI_FREQ   GNDR	1D_NO   GN_TYPE   SET_ID   H_FREQ GNDR     0001   JOSE   0001   1 M     0002   MARIA   0002   1 F     0003   LUIS   0004   1 M     0004   LUIS   0005   1 M     0005   CARLOS   0005   1 M     0006   CARLOS   0005   1 M     0007   IESUS   0007   1 M     0007   MANUEL   0008   1 M	10 NO   GN_TYPE   SET_1D   H_FREQ GNDR     0001   JOSE   0001   1 M     0002   MARIA   0002   1 F     0003   JUAN   0003   1 M     0004   LUIS   0004   1 M     0005   ANTONIO   0005   1 M     0006   CARLOS   0007   1 M     0007   MESUS   0007   1 M     0009   FRANCISCO   0009   1 M     0009   FRANCISCO   0009   1 M	10 NO   GN_TYPE   SET_1D   H_FREQ GNDR     0001   JOSE   0001   1 M     0002   MARIA   0002   1 F     0003   JUAN   0003   1 M     0004   LJIS   0004   1 M     0005   AMTONIO   0005   1 M     0006   CARLOS   0006   1 M     0007   JESUS   0007   1 M     0008   MANUEL   0008   1 M     0009   MANUEL   0009   1 M     0000   JORGE   0010   1 M	10 NO   GN_TYPE   SET_ID   H_FREQ   GNDR     0001   JOSE   0001   1 M

### EXAMPLE 1:

BOMEZ PEREZ, JOSE DAGOBERTO 016978 0007 0001 D

<u>IOSE</u> WILL BE ASSIGNED HFGN\_KEY
 <u>DAGOBERTO</u> (WHILE IN THE LIST OF GIVEN NAMES) IS A LOW FREQUENCY GN
 <u>DAGOBERTO</u> IS ASSIGNED A GN\_INIT KEY OF <u>D</u>

EXAMPLE 2:

r	_	_		_	_			 _	_	_		_		_
ore (Sampie)	CHAR VAR	æ	>	S	2	U	S	ĮL.	×	Σ	z		-	Ŧ
Hispanic Character (HCD) Data Store (Sample)	CHAR	8	B	S	S	C	၁	4	Ж	Σ	M			-
Hispanic C	OI LAS	100	100	002	000	964	8	037	052	870	8/0		993	093

BOMEZ PEREZ, JOSSE DAGOBERTO 016978 0007 ---(005) D (093) J/H BOTH JOSSE AND <u>DAGOBERTO</u> ARE LOW FREQUENCY GIVEN NAMES

• BOTH JOSSE AND <u>DAGOBERTO</u> ARE ASSIGNED A GN\_INIT KEY (093 (<u>J/H)</u> AND 005 (<u>D</u>))

• INITIAL VARIANTS ARE ACCESSED IN THE HISPANIC CHARACTER DATA STORE (HCD)

# EXAMPLE OF RETRIEVAL WITH HIGH FREQUENCY SURNAME KEYS AND MIXED GN KEYS

## LOW FREQUENCY PROCESSOR

## (2) Low Frequency Surname Processor

(Includes all SN not identified as HF, even HF Variant SN)

ple)														_
Data Store (Sam	LFDIKEY	AAI	. AA2	AL2	ALI	AL3	LV3	rv2	LV4	VA4	VA3	BAI	BA2	
low Frequency Surname Type (LFST) Data Store (Sample)	LFSN_TYPE	AALVAREZ	AALVAREZ	AALVAREZ	AALVAREZ	AALVAREZ	AALVAREZ	AALVAREZ	AALVAREZ	AALVAREZ	AALVAREZ	BARRIOS	BARRIOS	
w Frequency	ON GI	100000	100000	100000	100000	100000	100000	100000	100000	100000	100000	860000	860000	:
្ន	1													

BOMEZ PEREZ, JOSSE DAGOBERTO 016978 0007 ----(005) D (093) J/H

(IN ADDITION TO TREATMENT AS POSSIBLE VARIANT OF HF SN)

• ALL SN NOT IDENTIFIED AS HF SN WILL UNDERGO PROCESSING AS LOW FREQUENCY SURNAME

### WHAT IS SIMILAR?

HIGH FREQUENCY SURNAMES

			_	
001010	DATABASE	BARCIA	GARICA	
	QUERY	GARCIA	GARCIA	

IEZ	ſEZ	IRES	REZ
GAMEZ	BOMEZ	RAMIRES	AMIREZ
GOMEZ	GOMEZ	RAMIREZ	P A MIREZ

### LOW FREQUENCY SURNAMES

DATABASE	GARCIA	*BARCA	
OUERY	BARCIA	BARCIA	

,		_	,			
	GOMEZ	*BROMEZ		RAMIREZ	*AMIRO	* A D A MEZ
	BOMEZ	BOMEZ		AMIREZ	AMIREZ	AMERICA

\*RELATED TO LOW FREQUENCY NAME BUT NOT TO HIGH FREQUENCY NAME

## LOW FREQUENCY PROCESSOR

## (2) Low Frequency Surname Processor (cont.)

### BOMEZ

GOMEZ	BOI OM2 ME3 EZ4 BO2 OMI OM3 ME2 ME4 EZ3	AMEZ, BOEZ, BOM, BOMEZ, BOMERO, OMEZA, SGOMEZ, THOME	BOEZ, BOM, BOMEZ	013025 (BOEZ), 013454 (BOM), 013465 (BOMEZ)
HFSN_VAR KEYS	LFDIKEYs (Base and Positional)	LFDIKEY Threshold	DIGRAPH COMPARISON (LF_DI Threshold) (Note: GOMEZ retrieved with HFSN_VAR Key)	DI_KEY
HIGH FREQUENCY RELATIONSHIPS: (may be several relationships)	LOW FREQUENCY RELATIONSHIPS:			· -

EACH DI\_KEY USED AS EXACT MATCH KEY
 NAME MAY HAVE MULTIPLE HFSN\_VAR KEYS

2

3

## SAMPLE OF RETRIEVAL WITH LOW FREQUENCY SURNAMES

	Example of (	Example of Query Formats with Mixed Frequency Surnames	ith Mixed I	requency of	mames
in Additio	THORET	SLOPEZ	JOSSE	CARLOS	CRITERIA
OUENT #1					
HFSN_KEY		75000			
HFSN_VAR Key		0760			
DI KEY	000652 (THORET)				
	000714 (TOREAT)				
UCON KEY				2000	
GN INIT Key(s)			041 (J. H)		
HDM FORMATS:					1000
	THORET	LOPEZ (000976)			YOBS, RLA, MFU, GN initial = J or H; or UN= UO/
-	LOPEZ	THORET			YOB4, RLA, MFU, GN initial = J or H; or GN= 0007
2	THORET				YOB4, RL4, MFU, GN initial = 1 or H; or GN= 0007
	1 0000				YOB2, RL1, MFU, GN initial = J or H; or GN= 0007
4	THORET				YOB2, RL1, FU, GN initial = 1 or H; or GN= 0007
5	INONE				YOB0, RLO, MFU, GN initial = J or H; or GN= 0007
9	LOPEZ				VORO PLO MELI GN initial = Lor H: or GN= 0807
7	•	IHOKEI			CONTRACTOR OF THE CONTRACTOR O
×	•	LOPEZ			YOBO, KLO, MFO, GN INIII = J of H; of GN= 0007
	TORFAT	LOPEZ			YOBS, RLA, MFU, GN initial = 1 or H; or GN= 0007
	LOPEZ	TOREAT			YOB4, RLA, MFU, GN initial = J or H; or GN= 0007
7	TORFAT				YOB4, RL4, MFU, GN initial = J or H; or GN= 0007
	1.0957				YOB2, RL1, MFU, GN initial = J or H; or GN= 0007
4	TOBEAT				YOB2, RL1, FU, GN initial = 1 or H; or GN= 0007
	Concor				YOBO RLO MFU GN initial = J or H; or GN= 0007
9	LOPEZ				VORD BID MEN GN initial = 1 or H: or GN= 0007
7	•	TOKEAT			VODA DIO METI CNILIGIA - Los H. or GN-0007
œ		LOPEZ			TOBO, KLD, MFO, ON IMIGN = 1 of 11, of Civ = 000

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## DATABASE RETRIEVAL

## HIGH FREQUENCY RECORDS

(about 50% of the Hispanic data contain only HF segments; well over 55% contain HF SN with any type GN)

- USE SEARCH CRITERIA FROM HISPANIC DECISION MATRIX
- RESULT = RECORDS WITH HIGH FREQUENCY SURNAMES AND PRE-DETERMINED SURNAME VARIANTS ACCORDING TO SEARCH CRITERIA LIMITED BY GIVEN NAME AND RECORD GENDER ONE OF HFGN\_KEYs MUST MATCH

# MIXED FREQUENCY RECORDS

(over 26% of Hispanic data contain mixed HF and LF surname segments)

- USE SEARCH CRITERIA FROM HISPANIC DECISION MATRIX FOR LF SN THAT ARE HF VARIANTS • DETERMINE LIST OF VARIANTS FOR LF SURNAME AND GENERATE ADDITIONAL QUERIES
  - ONE OF GN KEYS MUST MATCH
- RESULT = RECORDS WITH HIGH FREQUENCY SURNAME (AND VARIANTS), HIGH FREQUENCY SURNAME RELATED TO LF SURNAME AND LF SURNAME VARIANTS; SOME LIMITATION BY SEARCH CRITERIA, GIVEN NAME AND RECORD GENDER

# LOW FREQUENCY RECORDS

(about 15% of Hispanic data contain only LF surname segments)

EXACT MATCH ON BOTH LF SN VARIANTS IN EITHER POSITION OR ALONE WITH RLYOB RESTRICTION ONE LF SURNAME VARIANT IN EITHER POSITION WITH YOB = EXACT YOB AND RL = 00 OR TYPE I SERIOUS

12

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3

0.67 8

0100

BOMEZ GAMEZ

0.71 0.17

000 000

GARCIA BARCIA LOPEZ

DATABASE RECORDS

QUERY

GARCIA

# HISPANIC FILTER AND SORTER

### (I) EXACT MATCH

(2) SCORES SN\_VAL GN\_VAL

(3) PARAMETERS SNTHR GNTHR ASVAL AGVAL OPGVAL OPGVAL INITSN INITSN TAQASN TAQASN TAQASN TAQASN TAQASN TAQASN

HFSN\_KEY DI\_VAL Database Records Retrieved with HFSN\_KEYs (Sample)

SN#1 HFSN\_KEY DI\_VAL SN#2

GARCIA 0001 GOMEZ

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13

### RECORD EVALUATION

Example of Surname Evaluation

SN Parameter Evaluation: OPSN Applies	GARCIA GOMEZ	0.67 • 0.65 = 0.44	1.00 * 0.65 = 0.65
SN Parameter		BOMEZ	GARCIA

Applies	GOMEZ		1.00 • 0.65 = 0.65
uation: ASVAL	CARCIA	0.62	
SN Parameter Evaluation: ASVAL Applies			
		GARZA	COMEZ

- DETERMINE SN\_VAL
  DETERMINE GN\_VAL
  DETERMINE COMPOSITE SCORE:

SN\_VAL \* GN\_VAL \* RL# PARM\_VAL \* YOB# PARM\_VAL \* COB# PARM\_VAL ORDER RECORDS
 (1) EXACT MATCH
 (2) BY COMPOSITE SCORE

7

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### The Use of Phonological Information in Automatic Name Searching

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March 25, 1997

PROPRIETARY INFORMATION



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### AIPA97 Paper Presentation: The Use of Phonological Information in Automatic Name Searching

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Automated Data Understanding Application Area:

Abstract

This paper describes a two-year research effort to incorporate phonological information into automated name searching. Specifically, names represented by standard roman characters are automatically converted to multiple phonetic representations, based on sets of regular expressions that relate character strings to predictable sounds or sound sequences using a widely accepted phonetic notation system, the International Phonetic Alphabet. Names are retrieved when there is an intersection of the regular expression of the query name with regular expressions of names in a preprocessed database. Additional similar names can be retrieved based on the articulatory characteristics of the sound segments contained in the query and database names.

### 1.0 Introduction

Variation in the spellings of names is a persistent issue in the area of automated name searching in large databases (Hermansen, 1985). In general, the source of spelling variation of names can be analyzed and explained a posteriori. Predicting any individual spelling, however, remains problematic. Sources for spelling variation include: keyboardbased data entry errors (e.g., hitting the wrong key: Genning for Henning), syntactic variation (e.g., out-of-sequence given name and surname such as Richard Thomas for Thomas Richard), morphological variation (e.g., truncated strings such as Rich or R for Richard) and semantically-based variation (e.g., nativizations such as Goldwater for Goldwasser). Of interest in the current paper is variation due to orthographic conventions (e.g., English can represent the same sound in more than one way, as in Stephen ~ Steven) and articulatory variation (e.g., the p in Thompson is a predictable spelling of Thomson based on principles of articulation). While there are multiple sources of name variation, this paper will present evidence 1) that the inherent ambiguity in the English use of roman characters can be mitigated by multiple mappings to unambiguous phonetic characters and 2) that phonologically-similar names can be retrieved through the analysis of sounds into their articulatory features (i.e., place and manner of articulation). It is based on research conducted from September of 1995 through the present.

### 2.0 Statement of Problem

Character-based name searching relies on spelling as the basis for calculating distance between the query name and the database name. While spelling using roman characters is not unrelated to pronunciation, the relationship between the two is often inconsistent (Cummings 1988), and the orthographic information (i.e., conventions of the spelling system of a language) is at times misleading. Thus, one spelling may map to multiple pronunciations: Lutz can be pronounced to rhyme with puts, cuts or shoots, and at least several additional non-English pronunciations are possible. The converse, of course, is also the case: there may be a number of ways of representing a single pronunciation: Lewis and Louis, for example, are usually pronounced identically by English speakers.

Character-matching techniques assume a reliable relationship between the orthographic system and the pronunciation. This assumption is flawed because the *goodness of fit* between orthography and pronunciation, especially for English, is *many-to-many*, that is, a given roman character can stand for more than one sound, and an individual sound may be represented in more than one way in the spelling system. Thus, the sound  $\{\Pi^i \text{ can be written as } f(Frank), ff(Taffy), ph(Phillip) \text{ or even } gh(Rough)$ . Conversely, the gh digraph may represent the [f] sound of Rough, be silent (Dough), or represent [k] (in some pronunciations of McClaughlin), [h] (in Monagham), [g] (in McGhee) or [gh] (across syllable breaks, as in Bighouse).

While much name variation can be traced to non-phonological issues, including syntax (order of name segments), aliases (John Doe for John Dillinger), morphological issues (Peg for Margaret) or data entry errors, many name variants can be traced to the relationship between orthography and pronunciation. Orally transmitted names, for instance, are especially prone to guesses on the part of the transcriber as to the "official" (i.e., legal) spelling of an individual's name. Language contact can account for some spelling variants as well (French Beauchamp and Anglicized Beecham), as can transcription from non-roman character sets (Wachmi and Ouakhmi, Xie, Hsieh and Sye) and sound change over time (e.g., Leigh is now pronounced the same as Lee).

Additionally, regular (i.e., predictable) processes of speech produce variability in how a name may be written. Thus, the presence of the letter p in *Thompson* is an artifact of poor articulatory timing as the articulators move from a nasal [m] to an oral [s]. (The variant spelling *Thomson* reflects a more etymologically justified spelling.)

### 3.0 Name Representation: Spelling

LAS has been investigating the feasibility and utility of incorporating information about the pronunciation of characters into the automated name searching process. The researchers considered a number of options, including an acoustic-level of representation and character-based rules, and determined that searching of character-based databases could be enhanced to include predictable language-based information about character-to-

Square brackets indicate that a sound is being represented, rather than a spelling.

A

sound mappings. Specifically, LAS recommended the use of the stock of phonetic symbols known as the International Phonetic Alphabet (IPA), widely used by linguists to represent the inventory of sounds used in the world's languages, and officially adopted by the International Phonetic Association (Laver, 1994). The IPA uses a closed set of symbols to transcribe speech in ways that are interpretable unambiguously by linguists, regardless of the language being described. (See Appendix A.) For example, the symbol [1] (placed between brackets to indicate that it represents a sound rather than a letter) always stands for a voiceless labiodental fricative, as in English thigh, while [] always stands for the equivalent voiced labiodental fricative, as in English thy. Thus, IPA disambiguates the English orthographic pattern of using th to stand for either sound: thigh [\$\pmu\_aj] versus thy [aj]. A name such as Gaither, of course, might be pronounced with either of these sounds, and would thus have two IPA representations, one for each pronunciation: [ge↓r] versus [ger]. There is international agreement by members of the International Phonetic Association, founded in 1889, as to the interpretation of IPA symbols. A reevaluation of the stock of symbols and special diacritic marks took place at the 1989 IPA Convention in Kiel, and the efforts of the Association have resulted in the unambiguous mapping of sounds onto IPA symbols that transcends individual speakers or languages (Laver, ibid.).

### 4.0 Mapping Spelling to Sound

The issue of how to predict pronunciation of names from orthography is far from trivial. Two key considerations include that:

- pronunciations of proper names are far less uniform than pronunciations of other vocabulary. The pronunciation of the noun dough is more-or-less fixed in English, despite the fossilized spelling that can be traced to an earlier pronunciation: The pronunciation of the name Lough is far less certain: individuals named Lough may well vary in their pronunciation of the family name and, even if all families named Lough could reach a consensus, there is no assurance that those unfamiliar with their consensus would guess that pronunciation. Additionally, some names retain old spellings that map to modern pronunciations in highly improbable ways (e.g., British Cholmondeley is commonly pronounced the same as Chumley). Claims of "correct" pronunciations carry little weight in terms of name searching; and:
- orthographies are language-specific. The pronunciation of the letter x regularly maps to [ks] and [z] in English (Alexander, Xenia), is regularly silent word-finally in French orthography (LaCroix), stands for the velar fricative [x], or [s] in Spanish (México, Xochimilco), and a [dz] or [] in Albanian (Hoxha). Additionally, standardized transcription systems from non-roman systems to roman exploit the letter x to stand for other, non-English sounds (e.g., Chinese Xie, Greek Xristos). Finally, any name may be nativized to fit the "borrower" language: spellings of non-Anglo names may be pronounced according to English orthographic conventions (e.g., French Duquesne pronounced [dukwzni].)

### 5.0 Writing IPA Conversion Rules

IPA is an effective notational system for representing pronunciation. LAS has written sets of rules that relate spellings to sounds. The rules are language-based, with sets of rules operating for Arabic, Mandarin Chinese, Hispanic and Anglo names. The rules assume:

- 26-character sets of roman letters, absent all diacritic markings, including accent marks or tone indicators;
- English speakers, either naïve or expert in the language of origin;
- one spelling can map to multiple pronunciations.

The rule sets were written to specific development databases made of single name elements, either surname or given, and taken from a variety of sources, including the U.S. Census list of the most frequent names in the U.S. and large U.S. databases of names from other countries. The names were manually tagged as "Arabic", "Mandarin Chinese", "Hispanic" and "Anglo", where "Anglo" was loosely interpreted to include Western European Germanic names (including Dutch and German). A team of linguists used a variety of sources to determine possible pronunciations, including native speaker knowledge and textual information (e.g., Cummings, 1988, Hanks and Hodges, 1989, 1990, Symonds, 1986). In general, rules were written broadly in order to ensure that most plausible pronunciations were captured. The Arabic and Mandarin Chinese rules included transcription variation (e.g., Chinese pinyin, Wade-Giles and Yale conventions of rendering Chinese names into roman script, as in Xie/Hsieh/Sye). The sample Anglo rule below is interpreted to mean that the letters sc preceded by anything and followed by the letters le can be pronounced as [s] or [sk] (e.g., Muscle and Mosclin):

sc/ anything \_\_\_\_  $le \rightarrow [sk?]$ 

Rules were implemented using standard regular expression notation. The following table shows a sample query and the names returned from a data file containing the 88,799 most frequent surnames from the U.S. census:

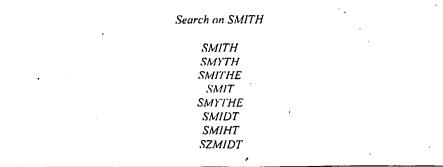


Figure 1 Search on name SMITH

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As an example of the advantages of matching on IPA, consider a query on the name Lee. Converted to the IPA string [li], exact matches with numerous spelling variants are automatic, including Leigh and Li. Typical character-based matches will fail to retrieve Leigh or Li, since the percentage of character overlap is minimal. Conversely, a standard index matching system such as Soundex will categorize Lee and Li identically, but will still miss Leigh, given the presence of a salient letter (g), and will retrieve a large number of names of low relevance, including Lu, Liao, Low, Louie. Luhoya and Lehew.

### 6.0 Phonological Processes

In addition to predictable spelling variation, rules were written to account for predictable articulatory processes (MacKay, 1987; Wolfram and Johnson, 1982). For example, the variant spellings of Thomson ~ Thompson, Simson ~ Simpson, Demsey ~ Dempsey, etc. can be accounted for by regular movement of the velum (i.e., the soft palate) from a bilabial nasal [m] to an oral [s]. Production of an intrusive bilabial oral [p] is entirely a result of the timing of the movement from nasal to oral articulation. LAS incorporated likely articulatory variation into the IPA rule sets. Thus, a query of the name Thomson will retrieve the variant Thompson as an exact match.

### 7.0 Testing the Rule Sets

To test the net effect of the Orthography-to-IPA rules, LAS conducted a controlled test of the rules by randomly selecting 157 test names from a database of 55,545. The database contained names that were from sources identified as Arabic, Mandarin Chinese, Hispanic and Anglo (again, broadly defined). A native speaker of educated standard American English was asked to record the 157 test names using pronunciations of his choosing. The audio recordings were played for native speakers of American English, who were asked to write one or more "likely" spelling for each name. LAS elicited 3,689 variants in all by playing the recordings to native speakers of American English. The variant spellings were then used as test query names to calculate the retrieval rates of the original name spellings. Overall, 69% of all variant spellings were retrieved by the IPA rules. However, qualitative analysis of the results showed that approximately 23% of the variant names not retrieved were due to perceptual mishearings of the recorded names. For example, the variant spellings of the test name Baughn predictably included Bahn, Baun, and Bonn, and the IPA Conversion Rules succeeded in mapping all to the original test name spelling. However, a fourth elicited spelling, Vaughn, was not predicted, and the IPA Conversion Rules did not map it to Baughn. The mishearing of [v] for [b] is not unusual, given the acoustics shared by the two sounds. The IPA Conversion Rules, which include regular articulatory variants such as Thomson/Thompson, were purposely not intended to retrieve perceptually similar names during the current phase of research.

### 8.0 Fuzzy Matches: Articulatory Similarity

At the heart of the research has been an effort to improve the automatic name searching process by retrieving names that are similar to the query name. The IPA Conversion Rules are able to capture a good deal of name variation that can be attributed to orthographic sources, whether intralingual (e.g., Leigh/Lee) or interlingual (e.g., transcriptions to roman orthography from Chinese: Xie ~ Hsieh ~ Sve). An additional goal has been to retrieve names that are not phonologically identical to the query name, but that a careful analyst would like to consider before abandoning a search. Thus, while spelling variants of the name Benke include Behnke and Benck, the analyst might want to consider names that seem phonologically close to the query name without being a predictable variant (e.g., Benge, Bankey and perhaps even names like Penke. Panke or Benische). While most search algorithms permit fuzzy matches, these are invariably based on calculations of number of characters shared. From the perspective of character matching, the letter h is as different from the p as it is from x, y or z. Thus, to permit retrieval of Penke for Benke is to require retrieval of any name that differs from the query by the first character, including Xenke, Yenke and Zenke. This clearly does not follow any phonologically reliable principle, and significantly reduces the efficiency of automatic retrieval. Even indexed systems, such as Soundex, group letters as either co-indexed or unrelated. Thus, while Soundex is often called "phonetic" because it groups letters that share some phonological characteristics, it cannot compare the degree to which two sounds, or indeed two names are related: it lacks granularity. Thus, Soundex would treat Benke, Penke and Panke as identical rather than similar. Soundex would exclude Bentsche from the group because of the letter t in the spelling, in effect treating Bentsche as being equally distant from Benke as from Smith.

It is clear, however, that sound segments can be analyzed in terms of their articulatory characteristics, and that some sounds fall into natural categories, such as vowels and consonants. Properties of sounds have been described in detail by a number of linguistic analyses according to place and manner of articulation (e.g., [p] and [b] are both articulated at the lips by complete blockage of the air flow and sudden release of pressure). One of the best known descriptions of phonetic classification is that of the American linguists Chomsky and Halle (1968). All the distinct sounds of American English can be described using 15 distinctive features (see Appendices B and C). By classifying sounds according to these distinctive features, a fairly clear picture emerges of how close any two sounds are to one another. Thus, [p] and [b] differ by just one feature, voicing, while [p] and [f] differ by three and [p] and [v] by four. In general, articulatory distance can be counted in terms of how many articulatory characteristics sounds share.

LAS created a file of feature differences between pairs of sounds, essentially mapping phonetic features onto IPA notation. By relaxing the threshold of allowable differences, increasingly distant sounds are retrieved. Thus, by permitting matches of IPA characters that are not exact matches, names are retrieved that are phonologically close. Even IPA sound-to-sound comparisons yield interesting sets of names for comparison. By relaxing

retrievals to include single feature differences, a search of the name Smith now brings back these additional names:

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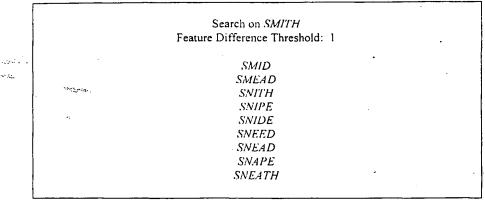


Figure 2 Fuzzy Search on Smith measuring Phonetic Feature Differences

Viewed in physiological terms, this is reasonable. Phonetic features refer to salient characteristics of articulation, so that differences generally reflect how likely it is that any two sounds would be articulated in place of another. There are numerous additional factors, of course, that ought to be considered in measuring how similar two names are to one another articulatorily.

### 9.0 Final Sorting of Names Retrieved

The names retrieved by searches on phonetic features may not all be of equal relevance to the query name. Additional factors are under consideration to sort names retrieved, based on a variety of phonological characteristics.

### 9.1 Sonority Level

The differences in phonetic features generally express the amount of effort needed to move articulators from one sound to another. The sounds [p], [t] and [k] form a natural class of voiceless stop consonants — identical in manner of articulation. All are extremely common in the world's languages, and are among the first acquired by children. They differ in place of articulation, and this is reflected in feature differences. However, manner of articulation is probably a better measure of energy expenditure than is place of articulation: voiceless stops are all extremely low in sonority, that is, the amount of energy needed to produce a sound. Vowels, on the other hand, require much more effort: they, in essence carry the sound wave. In order for feature differences to effectively measure level of effort required, differences should be weighted according to sonority level. In general terms, sounds fall into nine levels of sonority, with voiceless stops [p], [t] and [k] at the

low end and the vowels [] as in *father* and  $[\oplus]$  as in *fan* at the most sonorous end (Ladefoged, 1982). Sorts of names retrieved ought to consider the sonority value of sounds. This might be accomplished by weighting phonetic features or by a more complicated comparison of sonority level contours of names or syllables.

### 9.2 Syllabification



Additionally, in languages that time segments based in part on stress patterns, it is reasonable to compare stressed syllables to one another. In the following example, names have been aligned in terms of substrings, in this case corresponding to syllables:

Chester: 
$$\begin{bmatrix} \tau + \sigma \tau \rho \end{bmatrix}$$
  
Chesterion:  $\begin{bmatrix} \tau + \sigma \tau \rho \end{bmatrix}$   
Winchester:  $\begin{bmatrix} \omega & v & \tau + \sigma \tau \rho \end{bmatrix}$ 

Both in terms of articulatory effort (sonority) and psychological salience, it would be misleading to treat all three occurrences of the substring [t+] as equivalent: stress clearly must be included in the equation. LAS has written a syllabifier that automatically parses English IPA strings, including names, according to a set of rules. Future research will investigate the possibility of ranking similar names through analysis at the syllabic level. Syllabic level analysis has the strength of lining up comparable substructures of names. All syllables share the same internal structures (i.e., onset of the syllable, nucleus, and coda), and alignment by syllable enables meaningful comparisons of internal structures of names (where a period represents the syllable break):

$$\begin{array}{lll} \textit{Linda} & [\lambda & \nu & \delta \,] \\ \textit{Lisa} & [\lambda \, \iota \,\_ & \sigma \,] \end{array}$$

Note that in the above example, the coda (i.e., end) of the first syllable in *Linda* is filled by [n] but empty in *Lisa*, as indicated by the underscore. A meaningful comparison of the two names would compare the [n] of *Linda* to an empty coda rather than to the [s] in the onset (i.e., beginning) of the second syllable of *Lisa*.

### 9.3 Position in Name

Some weight ought to be given to absolute initial position in names. Many indexed systems, including Soundex, key names to the initial letter. This is, of course, problematic, since the initial letter may be silent or part of a digraph (e.g., Knox, Philip). However, indexing on the first sound, or at least considering the first sound as more significant than sounds in other positions may be warranted. This, like syllable-level comparisons, will probably be a factor in final sorting of names retrieved.

### 9.4 Non-Phonological Factors in Sorting of Names Retrieved

Certainly, it must be acknowledged that non-phonological levels of analysis may be critical to any useful definition of *similarity*. Morphological units – word parts that may contain

semantic information, including prefixes and suffixes — such as Mc-, -ton, and -sky are likely sources of variations. Thus, Lubin and Lubinsky are critically related (in terms of their roots), while Lubin, Rubin and Lupine are very close in terms of articulation. The morphological factor could be handled efficiently with a look-up list of morphological elements, but this remains outside the current scope of this project.

Similarly, orthography itself might play a useful role in the final sort of names retrieved. The following names retrieved for a fuzzy search on the name *Bucket* have been sorted using a simple sort on letters.

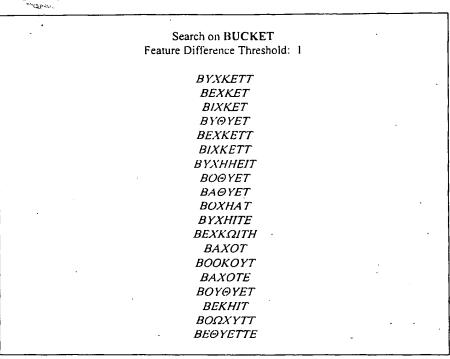


Figure 3 Search on Bucket Sorted by Spelling

Current plans are for a final ranking of names retrieved based on a combination of factors, including number of syllables, stress, weighting of features by sonority levels and name-initial segments.

### 10.0 Conclusions

In sum, automatic name searching can benefit in three ways from incorporation of phonological information:

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- leveling differences due exclusively to orthographic mapping:
- leveling differences due to predictable phonological processes, such as intrusive
- retrieving additional names that contain phonologically similar sounds to those of the query name.

Having retrieved phonologically relevant names, a phonologically-enhanced name search engine can then sort names using a multiple factor weighting scheme.

LAS views this technology as extremely promising, offering a tool to enhance current automatic name searching, increasing chances of retrieving name variants that characterbased systems miss by retrieving and sorting names in a phonologically principled way.

Appendix A: Descriptions of IPA Symbols

Phonetic symbol	Description	Example
p	voiceless bilabial stop	p in the English name Peter
b	voiced bilabial stop	b in the English name Buddy
Φ	voiceless bilabial fricative	f in the Japanese name Fujimori
-2	voiced bilabial fricative	b in the Spanish word saber
m	bilabial nasal	m in the English name Mary
<b>6</b> 35.53	voiced rounded palatal approximant	u in the French name Nuit
f .	voiceless labio-dental fricative	f in the English name Fred
v	voiced labio-dental fricative	v in the English name Vera
	voiced labio-dental nasal	n in the Italian word anfora
t	voiceless alveolar stop	t in the English name Ted
d	voiced alveolar stop	d in the English name Doug
θ	voiceless apico-dental fricative	th in the English name Theodore
×	voiced apico-dental fricative	th in the English name Rather
s	voiceless alveolar fricative	s in the English name Sam
z	voiced alveolar fricative	z in the English name Zachary
n	voiced alveolar nasal	n in the English name Nathan
1	voiced alveolar lateral	in the English name Linda
(0)	voiceless alveolar lateral fricative	II in the Welsh name Llewellyn
8	voiced alveolar lateral fricative	dhl in the Zulu word dhla (to eat)
<u>~</u>	voiced alveolar continuant	r in the English name Richard
	voiced apico-alveolar trill	r in the Spanish name Ricardo
0	voiced alveolar flap	tt in the English name Ritter
16	voiceless retroflex stop	as in the Arabic name Tariq
<del></del>	voiced retroflex stop	as in the Arabic word difda' (frog)
•	voiceless retroflex fricative	as in the Arabic name Sabir
(f)	voiced retroflex fricative	as in the Arabic name Dhafir
2	voiced retroflex nasal	Marathi (India)
Û	voiced retroflex lateral approximant	Marathi (India)
64	voiced retroflex flap	d as in Hindi dal (lentil stew)
•	voiceless palato-alvoelar fricative	sh in the English name Sheila
<u>(·</u>	voiced palato-alveolar fricative	z in the English word azure
Ø	voiceless alveo-palatal fricative	x as in the Chinese name Xia
	voiced alveo-palatal fricative	i in the Polish word ile
I.	voiceless palato-alvoelar affricate	ch in the English name Charlie
dC∙	voiced palato-alveolar affricate	j in the English name Jennifer
0	voiced palatal nasal	■① in the Spanish word Do■②a
<u> </u>	voiced palatal lateral approximant	II in the Spanish word calle (street)
k	voiceless velar stop	k in the English name Kim
g	voiced velar stop	g in the English name Gary
X	voiceless yelar fricative	x in the Spanish name Jose
	voiced yelar fricative	g in the Spanish word luego (later)
-0	voiced velar masal	ng in the English name Bing
	VUICCU VEIAI IIASAI	ng in the English name bing

Phonetic symbol	Description	Example
€	voiceless velar lateral	I in the Polish Walesa
K	voiceless labio-velar approximant	wh as in the English name White (for
		some speakers)
w	voiced bilabial approximant	w in the English name Wayne
q	voiceless uvular stop	as in the Arabic name Qasim
G	voiced uvular stop	Eskimo and Tehrani Persian
4	voiceless uvular fricative	ch as in the German word Buch
<b>8</b>	voiced uvular fricative	r in some Parisian pronunciations of the
		French name RenJe
Ñ	voiced uvular nasal	n in the Eskimo word eNima (melody)
R	voiced uvular trill	r in the French name RenJe .
0	voiceless pharyngeal fricative	h as in the Arabic name Muhammad
E>	voiced pharyngeal fricative	as in the Arabic name Sa'ad
و()	voiceless glottal stop	tt as in the English name Sutton or the
		word mitten
h	voiceless glottal fricative	h in the English name Henry
D	voiced glottal fricative	h as in English between voiced sounds,
		as in the word manhood
у.	high front rounded vowel	u in the French word lune (moon)
•	high central unrounded vowel	as in the Russian word s⊕n (son)
*	High central rounded vowel	u as in the Norwegian hus
0	high back unrounded vowel	u as in the Japanese name Kazu
u	high back rounded vowel	ou as in the French word tout
₽ı_	upper mid-front rounded	ö as in the German name Sch'nfeld
7	upper mid-back unrounded vowel	as in the Shan (Burma)word 'ko (salt)
0	upper mid-back rounded	o as in the English name Mona
<u> </u>	semi-high front unrounded vowel	y as in the English name Lynn
3	lower mid-front unrounded	e as in the English name Deborah
*	lower-inid front rounded vowel	oeu as in the French word oeuf (egg)
ຄ	lower-mid back unrounded vowel	u as in the English name Tupperman
9	lower-mid back unrounded	o as in the English name Ford.
F	open front unrounded vowel	a as in the English name Hal
0	open central unrounded vowel	a as in the Portuguese word para (for)
<u> </u>	low front unrounded vowel	a as in the French word patte (paw)
α	low central unrounded vowel	å as in the French name Delâtre or the
		word p>te (paste or dough)
_ <u> </u>	low back rounded vowel	o as in the British English word hot
*	mid central unrounded vowel	e & a as in the English name Belinda
<u> </u>	semi-high back rounded vowel	u as in the English name Butch
е	upper-mid front unrounded	a as in the English name Mable
_ <u>i</u>	high front unrounded vowel	first e in the English name Pete
ষ	rhotacized mid-vowel	ea as in the English name Heather

### Appendix A: Descriptions of IPA Symbols (Continued)

honetic symbol	Description	Example
ίØ	voiceless alveo-palatal affricate	j as in the Chinese name Jin
.f <u>Ω</u> ,	voiceless aspirated alveo-palatal affricate	q as in the Chinese name Qiu
ts	voiceless unaspirated dental affricate	ts as in the Chinese name Tsang
ts'	voiceless aspirated dental affricate	c as in the Chinese name Cao
Ø	bilabial click	as in Southern Bushman languages
- Paginero	dental (alveolar) click	as in Bushman
!	palatal click	as in Bushman
<b>-</b> &	palato-alveolar click	as in Hottentot
0	alveolar lateral click	as in Bushman, Zulu

يو. در

### Appendix B: Description of Phonetic Features

### A. Major class features:

I. Syllabic

Forms the central peak of a syllable. Vowels are usually +syllable, consonants are usually -syllable, but some (like [1]) may be syllable (as in "riddle")

2. Sonorun

Minimal constriction in the mouth. Vowels, as well as [n], [m], [r], [t], [w] are all +sonorant. Most other consonants are -sonorant.

3. Consonantal

Obstruction along a central point in the mouth. All English sounds except vowels and glides ([w] and [y]) are a consonantal.

### B. Manner of Articulation Features:

4. Continuant

Continued air movement through the mouth during sound production. This feature contrasts fricative sounds like [ f ] and [ v ] with non-continuants like [ p ] and [ b ].

5. Strident

Narrow obstruction through which air escapes, producing hissing or "white noise". [s], [f], [v] and the sounds in church and judge are +strident. This is the most acoustically-based feature in this list.

6. Delayed Release

Gradual release of air. In English, it is used to distinguish the sounds in church and judge from  $[\iota]$  and [d]

7. Nasa

Soft palate at the back of the mouth is lowered and air goes into nose. In English,  $\{n\}$ ,  $\{m\}$  and  $\{2\}$  (the final sound in king) are +nasal.

8. Lateral

Side(s) of tongue lowered so that air escapes along side, as in English [1].

### C. Place of articulation:

9. Anterior

Obstruction of mouth anywhere from gum ridge forward to lips. English [ p ], [ b ], [ m ], [ f ], [ v ], and [  $\Im$  ] (as in the) are all +anterior.

10. Coronal

Front of the tongue raised. The sounds  $\{t\}$  and  $\{d\}$  are +coronal. Sounds like  $\{k\}$  and  $\{g\}$  are -coronal.

11. High

Body of tongue raised. [j] (as in yellow), and the vowel [ H] (as in feet) are -high.

### Appendix B: Description of Phonetic Features (Continued)

- Low
   Body of tongue lowered. The vowels [ → ] as in back and [ 8] as in father are +low.
- 13. Back

  Body of tongue moved back. The sounds [k] and [g] and the vowel [u] as in boot are +back.
- 14. Tense

  Root of tongue muscle tensed. The vowel [ H ] (as in feet) is +tense. The vowel [ H ] as in fit is tense.
- 15. Round

  Lips pursed or rounded. English vowel [u] (as in boot) is +round, while [ \* ] (as in beet) is -round.

Phonetic Features	l p l	b	[f]
syllabic	-	-	-
sonorant	-	-	-
consonantal	+	+	+
anterior	+	+	+
coronal	_	-	
high	-	-	-
low	-	-	-
back	-	-	-
continuant	i	4, - 1	+
strident	-	-	+
delayed release	-	-	-
voiced	-	+	
nasal	-	-	_
lateral	-	-	-
round	-		-

03/06 '98 12:48

PAGE

### References

Chomsky, Noam and Halle, Morris. The Sound Panern of English, Harper & Row, New York, 1968.

Cummings, D. W: American English Spelling, The Johns Hopkins University Press, London, 1988.

Hanks, Patrick, and Hodges, Flavia. A Dictionary of First Names, Oxford University Press, Oxford, 1990.

Hanks; Patrick, and Hodges, Flavia. A Dictionary of Surnames, Oxford University Press, Oxford, 1989-90.

Hermansen, John C. Automatic Name Searching in Large Data Bases of International Names, unpublished dissertation, Georgetown University, Washington, D.C., 1985.

Ladefoged, Peter. A Course in Phonetics, Harcourt Brace Jovanovich, Publishers, San Diego, 1982.

Laver, John. Principles of Phonetics, Cambridge University Press, 1994.

MacKay, Ian. Phonetics: The Science of Speech Production, Little, Brown, and Company, Boston, 1987.

Symonds, Martin A. Mundarin Pronunciation, Taipei Language Institute, Taipei, 1986.

Wolfram, Walt and Johnson, Robert. Phonological Analysis: Focus on American English, The Center for Applied Linguistics & Harcourt Brace Jovanovich, Inc., 1982.

### Technology Demonstration System Narrative Description

February 26, 1998

Contract No. 97-F131000-000

Delivered to the Office of Research and Development



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2214 Rock Hill Road—Herndon, VA—20170.

### 1.0 Introduction

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This narrative describes the algorithms and techniques used by the Name Search - Technology Demonstration System (NS-TDS). It is the English-language version of the C++ source code that was used to develop the system. There are three major sections, covering NS-TDS support files, building the data base and performing a query. Each section relies on the contents of the previous section, so to effectively understand the system, this document should be read from beginning to end.

This narrative is tied to the source code through the use of paragraph numbers and comment lines. That is, whenever a block of code implements a technique or algorithm described in this document, a comment line has been inserted referencing the paragraph number. Comment lines are in the format, "// narrative paragraph number, x.x", where "x.x" stands for the paragraph number. If a block of code refers to more than one narrative paragraph, additional comments are added as separate lines.

### 2.0 Support Files

NS-TDS is a data-driven application dependent on a number of files that encapsulate years of computational linguistic research. These files represent the heart of the system and are essential to understanding how the primary algorithms work. This section of the narrative introduces these files by describing their purpose, contents and use.

### 2.1 Name Classifier Tables

TDS classifies the culture of a name as either Arabic, Chinese, Hispanic or "Other" (the default) by statistically analyzing its spelling. This analysis is accomplished with the aid of the following culture specific statistical distribution tables:

### 2.1.1 Digraph Score

Digraphs are contiguous letter pairs formed by parsing a name bracketed by a beginning and an ending boundary. For example, the name "FRED" consists of five digraphs: "#F", "FR", "RE", "ED" and "D#", where the symbol "#" represents a name boundary. In this table, digraphs that are clear indicators or contra-indicators of a particular culture are stored with a relative score. NS-TDS uses culture-specific tables to show the statistical likelihood of a particular digraph occurring in the applicable culture. For example, the digraph "QA" occurs almost exclusively in Arabic names, whereas the digraph "FM" almost never occurs in Arabic names. In the Arabic digraph table, "QA" is associated with a high positive score, and "FM" is associated with a low negative score.

### 2.1.2 Trigraph Score

Trigraphs are contiguous letter triplets that, for the purposes of TDS, are limited to the beginning and ending trigraphs. For example, the name "FRED" consists of the trigraphs "#FR" and "ED#". As with digraphs, NS-TDS uses culture specific tables to show the statistical likelihood of a particular trigraph occurring in the applicable culture.

### 2.1.3 Name Stop List

While generally good indicators of culture, digraph and trigraph distributions can erroneously classify specific names. For example, the name "BARKER" is identified as Arabic because it contains common Arabic letter patterns. The Name Stop List tables were implemented as a stopgap fix to this problem. For each culture, there is a Name Stop List table that contains a name along with a score that is either very positive (set to 2000) or zero (0). A high score means that name belongs to that culture; a score of zero means that the name does not belong there. So, "BARKER" is in the Arab Name Stop List with a score of 0.

The information in these tables is repeated for each culture and name part (i.e., given name or surname). For example, the following tables exist for Arabic:

agdi.dbf	Arabic digraph scores
agtri.dbf	Arabic trigraph scores
asdi.dbf	Arabic digraph scores
astri.dbf	Arabic trigraph scores

agnames.dbf Arabic given name stop list
asnames.dbf Arabic surname stop list

There are similarly named tables for Chinese starting with the letter "c" and tables for Hispanic starting with the letter "h".

### 2.1.4 Phonetic Rules

In order to convert the spelling of a name into a phonetic representation, NS-TDS consults several rule files. They contain records that consist of search parameters based on spelling and replacement regular expressions based on International Phonetic Alphabet (IPA) characters. Take the following rule, for example:

Boundary, "KN", Vowel, "(kn|kan|n)

It says that if the letter string "KN" is found at the beginning of a name ("Boundary") and is followed by a vowel, replace it with the IPA string, "(kn|kan|n)", where "|" indicates "or". The replacement string indicates that there are three possible pronunciations: [kn] or [kan] or [n]. (The use of square brackets is standard phonetic notation to indicate sounds rather than spelling). The spelling of a name is run through the rules until all characters are replaced with regular expressions. The name "KNOX" thus results in the regular expression (kn|kan|n)(a)(ks).

NS-TDS uses eight rule sets. For each of the four cultures (Anglo, Arabic, Chinese and Hispanic), there is a single vowel rule set and a multiple vowel rule set. The one vowel versions level all vowels to an [a] and produce fewer variations They are used for retrieval. The multiple vowel versions contain three basic vowel sounds, [a], [i] and [u], and are used in the ranking of retrieved names, since they are more precise than single-vowel rankings.

### 2.1.5 Simplified Phonetic Rules

One additional phonetic rule file is maintained to aid in the filtering process. It is a cross-reference file between all of the possible replacement strings in the single vowel rule sets and a simplified version of the replacement string. It is "simplified" in the sense that all unbalanced "ors" become balanced. For example, the replacement string (kn|kan|n) is "unbalanced" in that the possible pronunciations can contain one, two or three sounds. The simplified version is, (k?)(a?)(n), where "?" means that the sound is optional. The simplified string allows TDS to compare two regular expressions that may generate thousands of possible pronunciations with one calculation, thereby improving performance dramatically. Note that the simplified strings sometimes generate more possible pronunciations than the original replacement string, but never fewer. The additional pronunciations are handled adequately by the Ranker (see Section 4.5.1). Currently, this file is named tds.simp\_rul.

### 2.1.6 Leveled IPA Matrix

Generating retrieval keys requires the creation of leveled IPA variant strings. That is, similar sounds (i.e., [s] and [z]) are treated as a single set. NS-TDS uses a cross reference file to define the set relationships. It is currently called, grouparray.dat.

### 2.1.7 Feature Difference Matrix

One of the key components of TDS is the ability to calculate a phonetic score when comparing two names. When comparing individual sounds, the calculation weights the difference between two sounds based on a *feature distance.matrix*. This matrix consists of all combinations of two IPA characters and a score between 0.0 and 1.0 representing their phonetic proximity to one another, as defined by articulatory measures of similarity. It also contains records that represent the insertion or deletion of an extra sound. For example, the score assigned to the replacement of a [t] with a [d] is lower than the score assigned to the replacement of a [t] with a [k]. Further, inserting a vowel is given a lower score than inserting consonant such as [t] or [k].

The scores contained in this matrix reflect penalties. That is, higher scores mean that the sounds are further apart. All of the scores are based on linguistic principles of articulation, and reflect the number and type of phonetic features that cause the sounds to be different.

4".12.

### 3.0 Building the NS-TDS Data Base

In order to search a large number of names quickly, NS-TDS uses a data base of name information and indices. This data base is built by a program hereafter referred to as the *Data Loader*. This program takes as input a text file of names that are preceded with a group ID. The group ID is a minor component of TDS that was implemented to facilitate an independent evaluation by ORD.

Building the data base consists of two major steps. First, the names are pre-processed to generate the information needed by the retrieval, filtering and ranking algorithms. This pre-processed data is stored in temporary tables that are subsequently turned into the NS-TDS data base and indices. The following paragraphs describe this process in detail. Where appropriate, examples are used to make the description easier to understand.

### 3.1 Pre-Process Names

All names are pre-processed to ensure validity (see 3.11) and to gather the information necessary for retrieval, filtering and ranking. This process shares many of the components used to pre-process a query name during an NS-TDS search.

### 3.1.1 Edit the Name

Input names are provided to the Data Loader in a text file and are edited according to the following specifications: Positions 1 through 6 must contain a group ID, where the first character must be a digit or the letter "Z". All other characters must contain a digit. Position 7 must be blank. Positions 8 though 37 contain the name and can only consist of upper case letters or an apostrophe. Furthermore, the name must be at least 2 characters in length and no longer than 30 characters. Any records that fail to follow the prescribed format are rejected and written to an error log, along with an appropriate message.

### 3.1.2 Classify the Name

The spelling of the name is statistically analyzed to determine the probable culture (Arabic, Chinese, Hispanic, or "Other"). This analysis is accomplished with the aid of the name classifier tables.

First, the name is parsed into digraphs (contiguous letter pairs) and beginning and ending trigraphs (contiguous three letter triplets) (see 2.1.1 and 2.1.2). Next, the digraphs and trigraphs are located in the appropriate classifier table to obtain the individual score. All of the scores are summed to obtain a total score. This process is repeated for all cultures.

Then the Name Stop List tables for each culture are checked. If the name is found in one of the tables, the associated score is returned ("2000" means in the culture, "0" means not in the culture). If the name is found, the previously calculated culture score is replaced.

Finally, each score is compared to a culture-specific threshold. If no scores exceed the culture threshold, the name is classified as "Other". If one score exceeds the appropriate threshold, the name is classified accordingly. If more than one score exceeds the culture threshold, the highest score is chosen and that culture is returned. If there is a tie (very unlikely), the culture is chosen

alphabetically with Arabic first followed by Chinese and then Hispanic. It is important to note that an input name will receive only one classification.

### 3.1.3 Generate 1 Vowel Regular Expressions

In this step, the spelling of the name is run through the spelling-to-IPA phonetic conversion rules, to generate a regular expression that represents all of the possible pronunciations of the name. Every name is run through the single-vowel Anglo phonetic rule set, which is the default/generic rule set. If the name was classified as Arabic, Chinese or Hispanic, it is also run through the appropriate single-vowel rule set for that culture, generating a second IPA regular expression.

### 3.1.4 Generate Simplified Regular Expressions

Using the simplified phonetic rules, an simplified regular expression is generated. The expression is encoded into compact byte representations to make further calculations faster. As before, if the name was classified as Arabic, Chinese or Hispanic, a second simplified regular expression is generated according to the appropriate rule set.

### 3.1.5 Generate 1 Vowel Variants

Using the generated regular expression, a list of possible IPA variants is generated and added to a temporary table of variants for all input names. As an example, the name "KNOX", which generates the regular expression (kn|kan|n)(a)(ks), generates the following variants: [knaks], [kanaks], and [naks]. The temporary table lists all variants, as well as the name that generated the variant. It used later in the data base build process.

### 3.1.6 Determine the Initial Consonants

The variants are then analyzed, to generate a list of all possible name-initial IPA consonants. For example, the name "KNOX" starts with the regular expression (kn|kan|n), which can have an initial consonant of [k] or [n]. Note that if the variant starts with an IPA vowel, the first IPA consonant is used to build this list. Thus the name O'NEIL would have [n] as the initial consonant. This information is used by the Ranker (see section 4.4.4 below).

### 3.1.7 Set the Initial Vowel Switch

Next, the variants are analyzed to determine if it is possible for the pronunciation of the name to start with a vowel. It is a three-way switch that indicates whether the pronunciation (1) can never start with a vowel, (2) can sometimes starts with a vowel or (3) always starts with a vowel. This information is used by the Ranker (see section 4.4.5 below).

### 3.2 Build Data Base and Indices

This step takes all of the information produced during pre-processing and builds the data base and indices used by TDS for retrieval, filtering and ranking.

### 3.2.1 Create Name Files

A name file is generated for all four cultures processed by TDS (Anglo, Arabic, Chinese and Hispanic). "Anglo" represents the default, and therefore all names generate an Anglo record; only those names that are appropriately classified generate records in the other culture name files. Each record in the name file contains: the spelling of the name, the simplified regular expression codes, the list of initial consonants, the initial vowel switch, the group ID and an internal unique ID.

The naming convention is a four-letter culture identification followed by the extension, "nam". Currently, the following name files are generated: angl.nam, arab.nam, chin.nam and hisp.nam.

### 3.2.2 Generate Leveled Variants

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Using the variants generated during pre-processing and the leveled IPA matrix, a list of leveled variants is built. Furthermore, the input variants have duplicate contiguous characters removed. The IPA characters in "KNOX" generate the following numeric codes, based on sets of similar sounds: [k] = 5; [n] = 2; [a] = 0; [s] = 4; [z] = 4. (Note that [s] and [z] are both indexed as "4"; since they are similar sounds). The following unique leveled variants are generated: 52054, 502054 and 2054. Note that the number of leveled variants is usually less than the number of non-leveled variants. For each input name, the leveled variants are added to a temporary file that lists all leveled variants and the name that generated it.

### 3.2.3 Create Retrieval Indices

Retrieval indices consist of a unique sorted list of leveled variants. As with the name files, one index is generated for each culture. Each index is created by sorting and then *deduping*, i.e., removing duplicate forms from the previously-built temporary file of leveled variants.

The files produced by this step are named angl.idx, arab.idx, chin.idx and hisp.idx.

### 3.2.4 Create Index-to-Name Maps

Finally, a map file is created that cross-references all of the index records with the name records that generated the leveled variant. The retrieval index records contain a pointer to a map record. The map record contains a list of pointers to name records. This structure allows TDS to quickly scan the indices and generate a list of candidate names during retrieval.

The names of the map files are angl.vec, arab.vec, chin.vec, and hisp.vec.

### 4.0 Performing a Ouerv

The heart of NS-TDS is the ability to perform a query that returns a ranked list of results. This is done using five major steps: query pre-processing, exact phonetic search, similar phonetic search, initial ranking and final ranking. The following paragraphs describe these steps and their components in some detail. When appropriate, examples are used to make the descriptions easier to understand.

### 4.1 Pre-Process Names

The query name is pre-processed to ensure validity and to gather the information necessary for retrieval, filtering and ranking. This process shares many of the components used to pre-process an input name during the building of the NS-TDS data base.

### 4.1.1 Edit Name

After the user enters a query name via the user interface, it is edited according to the following criteria: The name can only consist of the 26 letters of the Roman alphabet or an apostrophe. Further, the name must be at least 2 characters in length and no longer than 30 characters. Errors are displayed to the user in a dialog box, along with an appropriate message.

### 4.1.2 Classify Name

If the user has specified that culture classification is automatic (the default), the spelling of the name is statistically analyzed to determine the probable culture (Arabic, Chinese, Hispanic, or "Other"). This analysis is accomplished with the aid of the previously described name classifier tables (see 2.1 above). If the user has overridden the default and manually specified a culture, this step is skipped.

The name is then parsed into digraphs (contiguous letter pairs) and beginning and ending trigraphs (contiguous three letter triplets). Then, the digraphs and trigraphs are located in the appropriate classifier table to obtain the individual score. All of the scores are summed to obtain a total score. This process is repeated for all cultures.

Next, the Name Stop List tables (see 2.1.3 above) for each culture are checked. If the name is found in one of the tables the associated score is returned ("2000" means in the culture, "0" means not in the culture). If the name is found, the previously calculated culture score is replaced.

Finally, each score is compared to a culture specific threshold. If no scores exceed the culture threshold, the name is classified as "Other". If one score exceeds the appropriate threshold, the name is classified accordingly. If more than one score exceeds the culture threshold, the highest score is chosen and that culture is returned. If there is a tie (very unlikely), the culture is chosen alphabetically, with Arabic first, followed by Chinese and then Hispanic.

It is important to note that an input name will receive only one classification. Further, if the classification is Arabic, Chinese or Hispanic, all further pre-processing will be performed twice (once for the default Anglo culture and once for the culture identified by classification or as manually specified by the user).

### 4.1.3 Generate 3 Vowel Regular Expressions

In this step, the spelling of the name is run through the multiple vowel phonetic rules to generate a state table that represents all of the possible pronunciations of the name in IPA form. Every name is run through the default Anglo phonetic rule set. If the name was classified as Arabic, Chinese or Hispanic, it is also run through the appropriate rule set for that culture generating a second state table. These will be used during the *exact* phonetic search (see 4.2).

### 4.1.4 Generate Multiple (3) Vowel Variants

Using the multiple vowel state table, a list of all possible IPA variants is generated. As an example, the name, "KNOX", which generates the regular expression (kn|kan|n)(a|u)(ks), generates the following IPA variants: [naks], [nuks], [kanaks], [kanaks], [knaks], and [knuks]. This list will be used to perform a brute force phonetic score adjustment on names that pass preliminary ranking (see 4.5).

### 4.1.5 Generate 1 Vowel Variants

Using the 1-vowel state table, a list of all possible one-vowel IPA variants is generated. As an example, the name, "KNOX", which generates the regular expression, (kn|kan|n)(a)(ks), generates the following variants: [naks], [kanaks], and [knaks]. This list will be used to generate retrieval and ranking information.

### 4.1.6 Determine the Initial Consonants

The single-vowel variants are then analyzed to generate a list of all possible initial IPA consonants. For example, the name KNOX starts with the regular expression, (kn|kan|n), which can have an initial consonant of [k] or [n]. Note that if the name starts with a vowel, the first IPA consonant is used to build this list. Thus, the name, O'NEIL would have [n] as the initial consonant. This information is used during ranking (see 4.4.4).

### 4.1.7 Set the Initial Vowel Switch

Next, the single-vowel variants are analyzed to determine if it is possible for the pronunciation of the name to start with a vowel. It is a three-way switch that indicates that the pronunciation (1) can never start with a vowel, (2) can sometimes start with a vowel, or (3) always starts with a vowel. This information is used during ranking (see 4.4.5).

### 4.1.8 Generate Leveled Variants

Using the appropriate one-vowel rule set, a temporary list of all possible IPA variants is generated. This list, along with the leveled IPA matrix, is used to build a list of leveled variants. Also note that duplicate contiguous characters are removed. For example, the IPA characters in KNOX generate the following numeric codes, based on sets of similar sounds: [k] = 5; [n] = 2; [a] = 0; [s] = 4; [z] = 4. (Note that [s] and [z] are both indexed as "4", since they are similar sounds). The following unique leveled variants are generated: 52054, 502054 and 2054. Note that the number of leveled variants is usually less than the number of non-leveled variants.

### 4.1.9 Generate Simplified Regular Expressions

Using the simplified phonetic rules, a simplified regular expression is generated. The expression is encoded into compact byte representations to make further calculations faster. As before, if the name was classified as Arabic, Chinese or Hispanic, a second simplified regular expression is also generated.

### 4.1.10 Initialize Search Parameters

The search parameters specified by the user or defaulted by the application are stored along with the query information. These parameters set thresholds for retrieval and filtering, and determine the weights given to individual ranking scores.

### 4.2 Exact Phonetic Match

An exact phonetic search is always performed by TDS. It is a quick search that retrieves names which share at least one possible pronunciation with the query name and passes them to the ranker. A search of the Anglo data base is always performed; if a non-Anglo culture was determined or specified by the user, the search is repeated for the appropriate culture.

### 4.2.1 Rétrieve Candidates

Each of the leveled variants generated by pre-processing the query name are used as a key to perform a binary search of the retrieval index, which is a set of unique leveled variants for the name data base. In the case of "KNOX", three leveled variant indices are retrieved: 2054, 502054 and 52054.

### 4.2.2 Retrieve Name Information

Using the index-to-name map files, all data base names and associated information that could possibly generate the leveled variants found above are put into a list. In the case of "KNOX", names such as "NOCKS", "NOX", "KNOCKS" and "NAUCHS" are returned.

### 4.2.3 Execute Exact Phonetic Match Algorithm

For each name retrieved, a regular expression is generated using the appropriate multiple-vowel rule set. Each of these is compared to the query's regular expression to determine if there is an intersection. In other words, the two expressions are evaluated to see if they can generate a matching variant. This evaluation is done by generating non-deterministic finite state tables and walking through each table until a match is impossible (i.e., the names do not match), or the end of both tables is reached (i.e., the names match). If the name passes this algorithm, it is placed in a list.

### 4.2.4 Pass Exact Matches to the Ranker

All names that pass the exact-match algorithm are sent to the Ranker, along with the information retrieved from the name file. In addition, the phonetic score is set to 1.0, which is the highest

possible score, and the pipe (rule set) that was used to retrieve the name is passed. Note that if a name was found to be an exact match under two cultures, it is included twice.

### 4.3 Similar Phonetic Match

A similar phonetic search is performed only if the user has requested it. Note that the default is to perform a similar search. It is slower and more thorough than the exact search, and retrieves names that sound similar (based on principles of articulation) to the query name to the ranker. A search of the Anglo data base is always performed; if a non-Anglo culture was determined or specified by the user, the search is repeated for the appropriate culture.

### 4.3.1 Scan the Retrieval Index

A complete scan of the retrieval index is performed, and each leveled variant is compared to the leveled variants generated by pre-processing the query. The comparison uses a standard edit distance calculation to determine how far apart two strings are. The algorithm determines the minimum number of edits (insertion, deletion or replacement of IPA characters) necessary to convert one string into another. A score is calculated by dividing the number of edits by the maximum length of the two strings and subtracting this fraction from 1 resulting in a score between 0.0 and 1.0. This score is compared to the retriever threshold, and those records with a score greater than or equal to the threshold are added to a candidate list.

### 4.3.2 Filter the Candidates List

This list is scanned and, if the name has not already been retrieved by the exact match algorithm, the simplified regular expression of the query name is compared to simplified regular expressions of all of the candidate names. This comparison uses a more linguistically sophisticated edit distance algorithm that takes into account the phonetic features of each sound. All edits are weighted according to the relationships stored in the Feature Distance Matrix, For example, the replacement of similar sounds that share most phonetic characteristics, like [s] and [z], are given a small penalty. The "cost" of replacements is determined by where and how sounds are articulated in the mouth and the "effort" required to produce one rather than the other. Similarly, some insertions and deletions of sounds are more costly than others (e.g., insertion of a [t] is more costly than insertion of a vowel, [a]). So, instead of computing the minimum number of edits required to convert one string into another, this algorithm calculates the path of least resistance. As with the retrieval calculation, a score between 0.0 and 1.0 is obtained by dividing the total penalty by the maximum length and subtracting this fraction from 1. This score is compared to the filter threshold, and those records whose score is less than the threshold are discarded.

Finally, it is important to note that because simplified regular expressions can generate more variants than the expressions they were derived from, it is possible for this score to be higher than expected, although it is impossible to obtain a lower score. This deficiency is corrected during ranking.

### 4.3.3 Pass Similar Matches to the Ranker

For all records that pass the filter algorithm, additional information is gathered from the name file via the index-to-name map. Also, the phonetic score of these names is set to the score

calculated during the filter edit distance calculation, and the culture pipe (i.e., rule set) that was used to retrieve the name is passed. This list is sent to the Ranker for initial scoring. Note that if a name was found to be a similar match under two cultures, it is included twice.

### 4.4 Initial Ranking

Names that pass the retrieval and filter stages via the exact or similar phonetic match searches are sent to the Ranker, along with the phonetic score calculated by the filter and all of the data built during the pre-processing stages (initial consonant, initial vowel, etc.). The ranker also knows which search (exact or similar) produced the return. It takes this information, calculates several other scores, applies weights to those scores based on the query parameters and produces a ranked list of names with combined scores. Initial ranking differs from final ranking in that it uses the phonetic score calculated by the filter. Final ranking, which is described below (see 4.5), performs a more exhaustive and exact phonetic score calculation.

### 4.4.1 Calculate the Spell 1 Score

Because spelling is a relevant factor in determining similarity of names, the Ranker is set up to consider spelling in its calculations in ranking of names passed to it. In the case of exact matches, for example, all phonetic scores are 1.0, but spellings can vary widely (e.g., "LI", "LEE", "LEIGH"). The Spell 1 score is a comparison of all the letters in the query name to all of the letters in the data base name. Each letter that matches contributes to the score, and no letter can be used more than once. Note that the position of the letter has no bearing of the score. So, the "K" in "KNOX" matches the "K" in "SACK". In addition, there is an option to bias the score so that letters on the left side of the query name count more than those towards the end. The "left-bias" factor defaults to true. A score is calculated by dividing the value of the matches (an integer, if left bias is not used) by the maximum length of the query and data base name and then subtracting this fraction from 1.0. This results in a score between 0.0 and 1.0.

### 4.4.2 Calculate the Spell 2 Score

The Spell 2 score works similarly to Spell 1, except that it uses digraphs instead of single letters. Digraphs are contiguous letter pairs formed by parsing a name bracketed by a beginning and an ending boundary. For example, the name "FRED" consists of five Roman character digraphs: "#F", "FR", "RE", "ED" and "D#", where "#" represents a name boundary. Digraphs build some contextual information into the calculation, with the result that "FRED" and "BRID", which share two non-contiguous letters, have a lower Spell 2 score than a Spell 1 score. Spell 2 uses the same left bias parameter and the same method to turn the calculation into a decimal number between 0.0 and 1.0 as Spell 1. Finally, the Spell 2 score contains a special adjustment for names that start with a vowel. For example, when comparing the name, "NEIL" to "ONEIL" and "SNEIL", the score for "NEIL" will be adjusted upwards by a small factor.

### 4.4.3 Calculate the Syllable Score

The Syllable score compares the number of syllables in the query name to the number of syllables in the data base name. Counting the number of syllables in a name is based on the spelling, and essentially says that a syllable occurs when there are one or more vowels in a row; preceded by a consonant or a word boundary. Adjustments are made for special cases such as, dipthongs (multiple consecutive vowels pronounced as two syllables) and "E" or "ES" at the end

of name which often does not produce a separate syllable. A score is produced by dividing the difference in the number of syllables between the query name and the data base name by the maximum number of syllables in the query or data base name and subtracting the resulting fraction from 1.0. This results in a score between 0.0 and 1.0.

### 4.4.4 Calculate the Initial Consonant Score

The initial consonant sound in names hold particularly prominent positions in determining similarity of names. The Initial Consonant score compares the first occurrence of an IPA consonant in the query name to that of the data base name. The consonants are compared based on the Feature Distance Matrix, producing a score between 0.0 and 1.0. For example, [s] and [z] will return a high score, whereas, [k] and [r] will return a low score. Note that the first consonant can be different as is the case with the name, "KNOPF", which could start with a [k] sound or an [n] sound. The algorithm compares all possibilities and returns the best possible score.

### 4.4.5 Calculate the Initial Vowel Score

The Initial Vowel score comes into play when both the query name and the data base name start with a vowel. If this is not the case, the initial vowel score is 1.0. Otherwise, the IPA vowel or vowels that start the names are compared and a score is returned based on the feature distances between them. The score is a decimal between 0.0 and 1.0.

### 4.4.6 Calculate the Culture Score

The culture score compares the culture of the query name as determined by the classifier or as specified by the user with the "pipe" (rule set) used to retrieve the data base name. So, if a name is classified as Arabic, and the name being ranked was passed to the ranker via the Arabic pipe, the culture score is 1.0. If the query culture does not match the pipe used to retrieve the name, the culture score is 0.0. This allows the Ranker to "bump up" names that share the same cultural identity, as in Chinese "CHIN" and "CHANG" (versus non-Chinese "CHAIN", for example).

### 4.4.7 Calculate the Final Score

The final or total score is an amalgamation of all of all the previous scores. NS-TDS maintains a set of parameters that allows the user to assign weights to each of the various individual scores. Note that in the user version, these weights are not modifiable. The weights are intended to be percentages, so that each factor is a decimal between 0.0 and 1.0 and the total adds up to 1.0. This is not a requirement, as the calculation recomputes the weights relative to one another.

So, to arrive at the final score, all of the individual scores are multiplied by their weight and the results are summed. This results in a decimal score between 0.0 and 1.0 with a higher score indicative of a better match.

### 4.4.8 Set the Ranking Order

The absolute ranking of data base names is based on whether or not the name is an exact phonetic match and on the value of the final score. Exact phonetic matches are always ranked first, followed by similar matches. Within these two categories, names are ranked according to

the final score, with higher scores ranked at the top of the list. It is quite possible that an exact match will receive a lower final score than a similar match (if its spelling and/or culture scores are low, for example), and yet be ranked above the similar match based on its category of "exact match". For example, "KNOX" returns the exact match "NAX" with a lower score (.825) than the similar match "KNAGGS" (.848), but forces all exact matches, including "NAX", to the top of the list.

### 4.4.9 Return a Ranked Set

Finally, the Ranker eliminates names that do not meet or exceed the threshold set in the NS-TDS parameters, unless the name is considered an exact match. Exact phonetic matches are always returned, regardless of their score.

### 4.5 Final Ranking

The purpose of Final Ranking is to incorporate a more accurate phonetic score into the overall ranking. Recall that the phonetic score used by the initial Ranker is calculated by the Filter, using simple regular expressions. This algorithm, while fast, can inflate the phonetic score, producing inaccurate ranking. Further, the Filter calculates using single vowel rules, which can introduce another source of inaccuracy (e.g., "LITZ" = "LUTZ"). Final ranking adjusts the phonetic score by performing a brute force edit distance calculation, using multiple vowel rules. This calculation is performed at this point because it is time-consuming, and must be limited to the smallest possible set of input data to meet performance requirements. Note that Final Ranking is a parameter option, although the default is set to true.

### 4.5.1 Recalculate the Phonetic Score

All names that were retrieved via the similar phonetic search and passed initial ranking are reprocessed to produce an accurate phonetic score. Names that were retrieved via the exact phonetic match search do not need to be recalculated because their phonetic score is always 1.0. First, the names are passed through the appropriate cultural multiple vowel rule set to produce a list of all possible IPA variants. Then, a brute force edit calculation is performed; every variant from the query name is compared to every variant of the data base name by performing a phonetic edit distance calculation. The best score is retained and assigned to the result.

### 4.5.2 Recalculate the Final Score

Using the same logic as that used by the initial Ranker, the Final Score is calculated using the new, more precise phonetic score. This will result in lower scores for some names; if these names fall below the final score threshold, they are removed from the ranked list.

### 4.5.3 Rebuild the Ranked Set

Finally, using the new score, the set of names is ranked again; with exact matches at the top followed by similar matches. Also, the final ranker will only return the maximum number of names requested by the user. The default setting is 145. Thus, it is possible for a name to pass NS-TDS, but not be displayed on output.

### Technical Plan Technology Demonstration System September 10, 1997 (amended)

Contract No. 97-F131000-000

Delivered to the Office of Research and Development



Language Analysis Systems, Inc. 2214 Rock Hill Road—Herndon, VA—20170

### 1.0 Introduction

This Technical Plan describes LAS's proposed design for the Technology Demonstration System (TDS) and includes a conceptual design, the target hardware platform, operating system, support software and development environment, the name data base and a work plan that provides a schedule for development and implementation.

### 2.0 Background

The TDS project is the result of the findings and recommendations of the Name Search Research Project, conducted from September, 1995 through June, 1997. The goal of the Project was to determine the utility and feasibility of using phonological information about pronunciation of person names in order to improve the quality of non-exact automatic name searching. Phase 1 of the Project concluded that there was substantial evidence to support the use of phonological information in automatic name searching. Specifically, the conclusions recommended:

- using the International Phonetic Alphabet (IPA) to represent multiple pronunciations of names unambiguously, and
- measuring articulatory similarity of names through phonetic features and processes.

Phase 2 of the Project built upon the results of Phase 1, specifically by:

- expanding, refining and testing sets of IPA rules from Phase 1 to represent multiple
  pronunciations of Anglo, Arabic, Hispanic and Mandarin Chinese names; test results
  returned at a retrieval rate of 92%;
- exploring a set of factors that contribute to articulatory similarity, including factors at the syllable level.

Phase 2 recommended the development of a Name Search Technology Demonstration System (TDS) to extend and transfer the phonology-based technology from the Name Search Research Project to a functional, automatic, integrated TDS.

### 3.0 Environment

The hardware and software environment are well defined. It is a simple environment that is geared to flexibility and performance. In other words, LAS does not intend to introduce complications by using resource intensive and/or expensive support software or hardware. TDS will be built using the following hardware and software components:

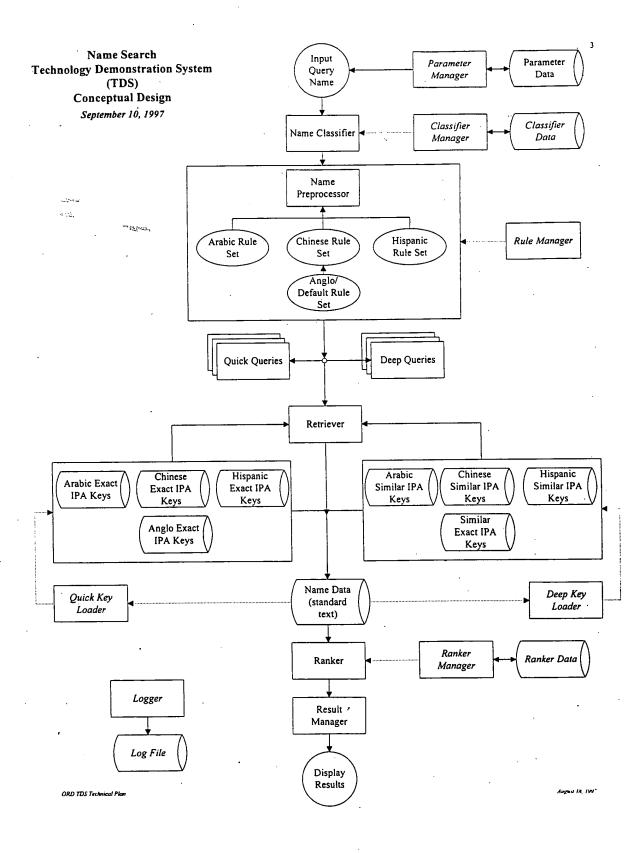
- Standard, high performance Intel-based laptop computers. By purchase time, we expect to configure the machines as follows:
  - Intel Pentium, Pentium Pro or Pentium II CPU;
  - 160 to 512 Mb of memory (160 is the current maximum);
  - 3 Gb of disk storage;
  - High speed CD-ROM (8x minimum);
  - Standard Ethernet network card for high speed data transfer;
  - High resolution monitor with a bright clear screen.
- Windows 32-bit operating environment and development software:
  - Windows 95 or Windows NT 4.x (depending on the processor available);
  - Microsoft Visual C++ version 5.x (for development only);
  - Microsoft Access (support table maintenance);
  - Custom data storage techniques maximizing memory usage (no RDBMS);
  - Multi-threaded architecture to begin displaying responses within 12 seconds.

TDS will run on a top-of-the-line standard laptop computer, a suite of custom developed executables and dynamic link libraries (DLLs) and standard end user software (i.e., MS Access, Excel, etc.). There will be no special or extraordinary system or software requirements.

### 4.0 Conceptual Design

The following diagram gives an overview of the system LAS intends to build. It is based on previous documents developed by the sponsor and LAS and represents research done to date. It identifies the major components and processes to be included in TDS; however, it is a preliminary design, and is subject to change depending on the outcome of further research and time restraints. After the diagram, each of the components and interactions between them is described in further detail.

In the chart, components that are identified in italics are support functions not intended for standard use. They are, however, necessary for LAS to build, tune and test the system.



**Input Query Name** - A simple Graphical User Interface (GUI) will be built to allow the user to enter a name that will be compared to the name data base.

Parameter Manager - LAS will provide options so the user can tune or limit the search. These options will be controlled through the GUI and stored in a Parameter Data set. Parameters currently being considered include:

- exact only (fast) or exact and similar matches;
- level of similarity (loose or tight);
- culture specific matches (Anglo, Arabic, Chinese and/or Hispanic);
- number of returns (maximum/default = 145);
- · bypass name classification.

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Note that it will not be necessary to set parameters to perform a name search. Default parameters will be used in the event that the user goes directly to the name check screeen.

Name Classifier - The name classifier determines whether the ethnicity of a name is Arabic, Chinese or Hispanic. The LAS name classifier uses a data base of contiguous letter pairs (digraphs) and triplets (trigraphs) that has been statistically analyzed to rank digraphs and trigraphs according to ethnic origin. With this information, it calculates a score for each culture that shows the probability of the name being Arabic, Hispanic and/or Chinese The highest positive score will determine which non-Anglo algorithm to use in addition to the standard Anglo algorithm. Note that it is possible for all scores to be negative, in which case only the Anglo algorithm will be used. This component will be based on an existing system developed in Clipper by LAS that will be converted to C++ to better interface with the other components.

Classifier Manager - This is a simple interface necessary to apply values to the digraphs and trigraphs according to ethnicity. Most likely, LAS will use a standard data base package to manipulate classifier data (i.e., MS Access). Note that the existing classifier data base is already returning adequate results. Improvements will be made if time and resources permit.

Name Preprocessor - At a minimum, this component will convert the input name into one or more IPA representations. Almost certainly, it will generate numerous variants based on different phonetic representations that will be passed to the Retriever. Furthermore, additional information about the query name will be necessary in order to use the similar search keys (i.e., name length, syllabic structure, etc.).

Rule Sets - Four rule sets will be used to convert Roman character representations of names into IPA representations. The default rule set, Anglo, will always be used; the other three, Arabic, Chinese and Hispanic will be used if the name is classified as belonging to one of these ethnic groups and the user has specified that other ethnic variations are to be used. These rule sets will be based on the work done in previous projects. The Anglo rule set will need considerable

modification to support Anglo pronunciations of non-Anglo names. They will be maintained by a Rule Manager, that allows LAS to build and modify rule sets as necessary.

Quick Queries - To ensure that the 12 second initial response time requirement is met, LAS intends to segment and multi-thread searches of the name data base. Quick queries retrieve those records that contain the same IPA characters or the same IPA consonants with a vowel place-holder, or the same IPA consonants. The ultimate retrieval scheme will be determined by further research. This approach will allow TDS to pass a small subset of data to the Ranker and begin returning most of the "best" names quickly. Note that this scheme does not consider differences in name length (i.e., insertion and deletion). The output of the quick query component will be a list of IPA representations that the Retriever will use to extract records for evaluation by the Ranker.

Deep Queries - By far the most difficult problem to solve, deep queries will allow TDS to subset the name data base into phonetically similar sections and account for varying levels of name and possibly syllable length. They must consider the insertion and/or deletion of IPA characters and the proximity of different IPA characters based on the number and importance of features they have in common (e.g., "p" and "b" differ by only one phonetic feature). Almost certainly, deep queries will include all names retrieved by quick queries. If performance is acceptable for deep queries, the quick query logic may become unnecessary. The output of the deep query component will be a list of IPA representations that the Retriever will use to extract records for evaluation by the Ranker.

Retriever - This component accepts query lists from the query preprocessors and passes subsets of the name data base to the Ranker. Operating simultaneously with the query components, it processes query lists in the order that they are received. Each input list will be identified as a "quick" or a "deep" list so that the component can choose the proper key set to use to generate the output list. Once the subset is determined, the retriever will build a list or a range of records to be passed to the Ranker. This list will contain the IPA representation used to retrieve the record, the actual Roman character representation of the name and the rule set used to return the name.

Quick Keys - Each name in the data base will generate one or more IPA representations of the Roman character version. Each rule set can generate different IPA representations. All representations will be stored in the Quick Key data set that will point to the name that generated the particular version. Furthermore, quick keys will be tagged as belonging to the rule set that generated the representation.

Deep Keys - This data set will consist of keys that contain IPA representations, IPA similarity, name length and possibly, syllabic information. It will be designed to allow for subsetting of the name data base into names that are potentially similar to the query name. It must overcome the two major problems in determining name similarity: sounds can be mispronounced (Pine = Bine) and names can be substrings of each other (McDonald = Donald). A key area of research that must be resolved early in the project is the use of indices to represent similar IPA characters (one character to represent "b" and "p").

ORD TDS Technical Plan September 10, 1997

Name Data - This component represents the raw data provided by LAS internally for development and ultimately by the sponsor for the production version of TDS. Each name will be stored in its Roman character representation and will be identified by a record ID. These ID's will be used to tie the raw name to the quick and deep keys.

Key Loaders - Batch programs will be developed that take an ASCII text file of names as input to generate the Name, Quick Key and Deep Key data bases. This program will use the Name Classifier and Name Preprocessor to generate keys and build or rebuild these data bases. It will edit the names and produce a summary statistical report and a detailed error report showing any abnormalities encountered (i.e., invalid length, invalid characters, etc.).

Ranker - This component processes a list of candidate records generated by the Retriever. The list will consist of records containing the IPA key that returned the record, the rule set used to generate the IPA key and the actual name. The Ranker will sort the names in order of match quality based on parameters set in the Ranker Manager data set. Output will be passed dynamically to the Result Manager for real-time display to the user. Ranking methods will be based on schemes developed in phase 2 of the phonology project (regular expression intersection and the "voter scheme"). It will also consider the rule set used to regularize the input name into IPA representations.

Ranker Manager - This is an optional component that will allow LAS and/or the sponsor to rank returns according to different sort schemes. As mentioned above, the ranking schemes will be based on previous work: regular expression intersection or a voter scheme, and possibly, non-phonetic schemes such as: Soundex, digraph analysis, edit distance methods, etc.

Result Manager - This component will accept input from the Ranker, and maintain a deduped, sorted list based on the parameters set by the Ranker Manager. This list will be passed to the GUI for display to the user, and it will be managed dynamically so that the list is constantly being updated as results are processed by the Ranker.

Display Results - This component is the output side of the GUI. It displays the list produced by the Ranker for viewing and other manipulation (printing, saving to a file, etc.) by the user. The outputs are maintained by query name and are updated dynamically as results are returned from the Ranker. In addition to the ranked list of names, the GUI will also display information on why a particular name was chosen and will be given a score that relates to names above and below it on the list.

Logger - This component will be a development and debugger tool for LAS to determine how well TDS is working, and to aid in testing and problem resolution.

5.0 Name Data Base

ORD TDS Technical Plan September 10, 1997

The ultimate target for TDS is a sponsor data base consisting of 3 million unique name segments (i.e., "John" and "Fitzgerald", not "John Fitzgerald"). LAS must generate a similar data base of name segments since the sponsor data base is classified. To do this, LAS will take advantage of numerous resources that will be used without compromising the privacy and sensitivity of the data. That is, only name segments will be extracted from these sources. It will be impossible to tie the TDS names to the source data base. Sources to be used include:

- Visa Lookout Data from the Department of State;
- Passport Lookout Data from the Department of State;
- Census Data from the Department of Commerce;
- Phone Book data from commercial sources;
- Known variant lists.

Should the above sources fail to generate 3 million unique name segments, LAS will resort to generating variations by programmatically manipulating letter variations (i.e., "ck for "ch", "e" for "i", etc.). Currently, LAS has processed 20 million names, which have generated 1 million unique name segments.

Crucial to the successful completion of TDS is an opportunity by LAS to evaluate sponsor data as soon as possible. While not in the Statement of Work or the Project Plan, LAS feels it is advantageous to the sponsor to allow LAS to gain access to the sponsor name data base as soon as possible. While no problems are expected, it is prudent to verify this assumption as the success of TDS is ultimately dependent on the ability to successfully integrate sponsor data.

### 6.0 Work Plan

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Please note that this section of the Technical Plan has been copied in entirety from the Project Plan previously submitted. Attachment A to this plan is a Gantt chart with a Work Breakdown Structure that describes the schedule of development LAS intends to follow. The rest of this section describes the major events in the Gantt chart.

The schedule for the development of TDS spans eight months and consists of four major phases:

- Planning One month to generate project and technical plans.
- Phase 1 Development Three months to resolve research issues, determine a strategy
  to find "similar-to" names, define and validate linguistic search techniques, and
  produce a limited version of TDS for an early look test.
- Phase 2 Development Three months to expand phase 1 into a fully functional
   system to include expanded rule sets that enable TDS to accommodate Anglo
   pronunciations of foreign names and native pronunciations for Arabic, Hispanic and
   Chinese names.

- Implementation Four months (with three months overlapping the development effort) to procure two laptop computers, install the system for the sponsor, provide training, and document the results of the project.
- Maintenance Four months to modify, upgrade and correct TDS at the direction of the sponsor.

Each phase concludes with a specific set of deliverables (both internal to LAS and formal deliveries to the sponsor). There is some flexibility in the schedule, however, the dates set for sponsor deliveries are firm.

### 6.1 Phase 1 Development

The purpose of phase 1 is prove that LAS can develop a viable name search system based on phonetics. The goals are to produce a complete design for TDS and develop a prototype system. Although limited in functionality, the prototype must be complete enough to pass an early look test based on a test plan generated by LAS. The sponsor has the ultimate authority to decide whether or not the prototype justifies further development. Phase 1 consists of the following tasks:

- Research Previous work by LAS has generated many working theories and prototypes/work benches. All of this work must be analyzed further to determine which theories are best applied to TDS. In early September, when this task is scheduled to conclude, LAS will know how all of the major components of TDS will work and will have a conceptual design document that drives further development. In addition, LAS will deliver input specifications for data to be loaded into TDS.
- Development Based on the outcome of the research task, LAS will develop the first limited version of TDS. Ideally prototypes developed during the research task will form the basis for this version of the system. In addition, the Linguistic team will continue to refine their research from the previous period and provide guidance to the Technical
- Test Plan During research and development, a test plan will be developed. First, requirements will be culled from existing documentation and results from the research task. Then, these requirements will be used to develop test scripts. There are four major areas to be tested: functionality, performance, retrieval accuracy and ranking accuracy. The test plan is a deliverable required by the contract.
- Build and Test A week has been reserved in the schedule to integrate the output of the development task, after which there are three'weeks to execute the test, make any corrections and document the results.

While subject to change, the plan calls for the first version of TDS to contain the following features:

- A fully functional name classifier that can identify Arabic, Chinese and Hispanic names.
   The name classifier will be ported to C++ from LAS's already developed PC-NAS system that is currently written in Clipper.
- Name processors for Anglo and Arabic names. Note that in this phase, the Anglo name processor will not include the extended rule set for atypical Anglo names.
- A fully functional name data base with a key structure that accommodates both IPA exact
  match and phonetically "similar to" searching. A program to load raw data into the name
  data base will also be produced during this phase. The name data used will be obtained
  from LAS resources.
- A search engine that when given a query name and it's ethnicity will search the name data base and provide a list of matches.
- A limited version of the ranker with a sorting algorithm to be determined during development.
- A limited graphical user interface (GUI) to allow for evaluation of the TDS.

### 6.2 Phase 2 Development

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Phase 2 provides three months to complete the development of TDS. Currently, the features to be developed in this phase are:

- Develop the Hispanic and Chinese name processors.
- Extend the Anglo name processor to include rules for atypical Anglo names and pronunciations.
- Complete the Ranker to include a sort algorithm with additional sorts as deemed useful.
- Finalize the GUI to include all features required by the sponsor and/or deemed desirable by LAS.
- Finalize the TDS documentation to include a simple user manual and descriptions of all algorithms.

ORD TDS Technical Plan September 10, 1997

Phase 2 culminates in the execution of an acceptance test with time built in for bug fixes and test documentation.

### 6.3 Implementation

The final task is to deliver the system to the sponsor. LAS will purchase, test and configure two high-end laptop computers, load sponsor data into TDS, provide training, and write a final report.

ORD TDS Technical Plan

September 10, 1997

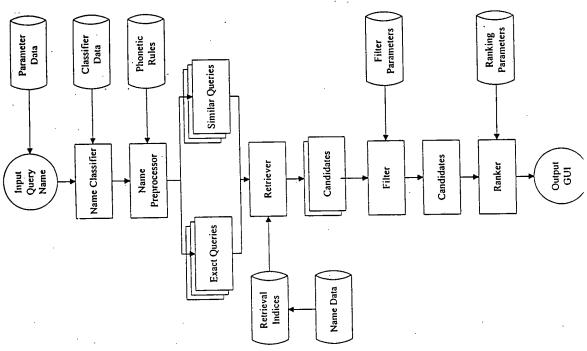
# Technology Demonstration System Acceptance Test Name Search

February 11, 1998



Language Analysis Systems, Inc. 2214 Rock Hill Road—Herndon, VA—20170





# Technology Demonstration System

- · A phonological name search system
- Technology based on the research results of an 18-month project
  - A prototype developed to demonstrate the capabilities of this technology

## Characteristics of TDS

- Each query drives the list of returns
  - no a priori set or group of names
- "on-the-fly", automatic process of associating query name with database names
  - allows multiple relationships among names
- Pronunciation and spelling contribute to measures of similarity
- System returns ranked list of similar names

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TDS Acceptance Test

# Characteristics of TDS (cont.)

- · Culture-based rule sets
- Names are automatically classified as Arabic, Mandarin Chinese, Hispanic or "Other"
  - Arabic, Mandarin Chinese and Hispanic rule sets process names based on automatic classification
    - classification E.g., Arabic rules:  $Qaddaft \sim \underline{Kh}addafy$
- All names are processed by Anglo rules

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# Key Characteristics of the TDS

- · fast
- principled
- · fully automatic
  - sorted returns
    - multicultural

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### Scope of the TDS

- · Not a full retrieval system
- retrieves single names (e.g., Smith)
- · Other factors not covered by TDS:
- Dialect: Chinese Ng = Wu = Huang- Stems and affixes: Vega ~ Delavega
- Typographical errors: JpnesPerceptual issues: Polk misheard as Holtz

# Technical Overview of the TDS

- · Written in Microsoft Visual C++ for Windows NT
  - · Six-month development period
- · Effort concentrated on indexing strategies, search algorithms and ranker
  - · Minimal effort spent on User Interface
- with a 233 MHz Pentium MMX, 160 Mb of • Currently running on an IBM ThinkPad 770 RAM

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## TDS Acceptance Test

Purpose of today's Acceptance Test:

To determine whether the TDS satisfies the requirements of the Statement of Work

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### Requirements of the TDS

- I. The TDS will incorporate a search component using phonetic name search algorithms (IPA exact match and phonetically "similar-to")
- 2. The TDS will incorporate a name classifier component automatically identifying a query name as a member of a specific culture for which culture-specific name processing rules can be applied
  - 3. The cultures to be implemented in the Name Classifier component are Arabic, Chinese, Hispanic and Other (including Anglo)
- 4. The TDS will incorporate a rank-ordering component that ranks the results from the search component, a name database and its supporting database management system, and a graphical user interface

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- 5. The individual software components that are directly related to name searching should be designed and written to be modular
- 6. The TDS will work on a name database consisting of at least three million names
- 7. The TDS will allow a user to input as a query a name in Romanized form
  - Accepts entry of a single name segment only
- Accepts input length 2 30 characters as valid entry
- Accepts lower and upper case letters as valid entry
- Accepts alphabetic characters and apostrophe as valid entry

match or phonetically similar-to

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# Requirements of the TDS (cont.)

- 8. Names that have been classified by the Name Classifier as Arabic, Chinese or Hispanic will be processed by their respective language-specific components, as well as by the English (Anglo)-language components. All names will be processed by the Anglo components.
  - 9. The TDS will rank and display retrieved names in order of phonological similarity to the query name, with Exact Matches displayed at the top of an ordered list
- The TDS will include a batch processing component
   The ranking algorithm should be general enough to apply to the full set of names retrieved regardless of whether the technology responsible for the retrieval was IPA exact

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- 12. The TDS shall begin to display the results of each query against a name database of about three million names within twelve (12) seconds
  - 13. The user shall be able to select for each query whether "sinilar-to" logic is to be used in the retrieval process
- 14. The user shall be able to select for each query whether the user will bypass the name classifier and manually specify the culture of the query name
- 15. The user shall be able to select for each query whether the name classifier is to be used; if not, the query shall be processed as an English (Anglo) name (in addition to the manually specified culture, if any)

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19. Each option selected shall become the default option and 18. The TDS display will include the list of hits returned along with each name's six character group number

20. The contractor may include other options that satisfy the needs of its developers and other personnel, as long as the default for those options is off shall apply to all queries until the user changes it

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# Requirements of the TDS (cont.)

16. The user shall be able to select for each query the maximum number of hits to be displayed

phonetically "similar-to" technology) shall be displayed 17. The reason a name was retrieved (that is, whether the retrieval of a name was due to IPA exact match or along with the name 3

21. The TDS software shall be written with English comments embedded in the code that implements each algorithm

25. The TDS will accept the following input when performing the pre-processing of the client's names database:
ASCII LEAT file

Requirements of the TDS (cont.)

Allowable characters include ketters of the alphabet and the apostrophe (').

Lower case letters will be converted to upper case Each record will contain two fields separated by a blank as specified below:

Columns I through 6 will contain the Group Number; the first chusacter may be either a 'Z' or a number; the temaining 5 chusacters must contain a digit

Columns 8 through 37 will contain the name. The name must be at least 2 characters long, and no longer than 30 characters

Column 7 must be blank

Client database may exist on 3.5" diskette or CD-ROM

Duplicate names will be rejected

- 22. The comments shall tie blocks of code (a block of code is one or more sequential lines of code) in each algorithm's implementation to the step being implemented in the deliverable English-language narrative that describes the algorithm
  - 23. The TDS should be designed so that new technology can be easily incorporated as it becomes available
    - 24. The TDS will include a batch processing option for results retrieval

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26. Each query name and all the names retrieved by the TDS (not to exceed the limit in use at that time) will be saved in an internal file until the user selects to delete it

27. The TDS will also provide the capability to write the saved data onto a hit file resident on diskette(s) when directed by the user

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### **TDSFINAL**

```
void FactorBáit::OnKeyDom(UUT nChar, UNT nRepChr, UNT nRiags)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /// function to convert the text in the control to a /// deable, and then back to a text representation /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2) expension /// (11.2)
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[//[(I/KY,KO), PAPE FACCORDIL.]

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SetWindowfext (namString);
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OnKillfocus();
recurn;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FactorEdit:: FactorEdit()
Factor Edit :: Factor Edit ()
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nicker Debus Medice new Debus just Americant Nicspile Static cher Milspile() \* \_\_Pile\_\_; Hensit

IMPLEMENT\_DYNERETE (FactorEdit, GEdit)

Capyright (C) 1998, Language Analysis Systems Inc.

Rinclude "schafk.h" Binclude "PactorEdit.h"

// FactorEdit.cpp : implementation file // Copyright (C) 1998, Language Anal

FACTOR-1.CPP 3-24-98 12 14p

Page 1 of 1

```
BCOL InitDialog::OnInitDialog()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                #itradef TDSG_USER_VERSION
                                                                                                                                                                                                                                                                     === 8
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       //[[Ax_Data_untTinicDialog]
// Intr. the ClassMitard vill add menter initialization here
///[Jax_Data_nr]
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([Arx Dark MAPIIntcDiatog)

IDM_Control pDX: IDC_STATUS_STATUC, m_statusStatio);

//||Arx_Dark_MAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              InitDialog::InitDialog(CMxd* pParent, ofstream *aLogStream)
: (Dialog(InitDialog::IID, pParent)
                                                                                                                                                                                                                                                                                                                                                           define a messages that the init thread can post to the dialogy sguittened to end the dialog update the results of the current query.

TOSQ_NHI_EXHE
CAPTIGHT (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // tell the init thread to stop processing userMantsToCancel • true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          void InitDiulog::ExAutaExchurge(ClutaExchange*pDX)
{
                                                                                                                                                                                                                                                                                                 UINT searcher_init_thread_func( LPVOID pParam );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BEDIN_PESSACE_MAP(InitDialog, CDialog)

I// HXx Yea; MeVinitDialog)

OL BY_CLOSDICONTEL, OrCancelButton

I//) NXX_USC_MAP
                                                                                                                                            Nifer _DEMOS
Nettine new OEBNJ_NEW
NETHER THIS_FILE
Static char THIS_FILE];
Needit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HALDLE IPHANCIES(II);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             void InitDialog::OnCancel()
                                                    Minclude "sciatk h"
Winclude "tds.h"
Winclude "InitDialog.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // InitDisloy dislog
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         END MESSAGE MAP ()
                                                                                                                                                                                                                                                                                                                                                                                                                                        #define
```

(it (logstream)
'indialization of TDSSearcher completed successfully," <= entl;
'indialization of TDSSearcher completed successfully," <= entl;

'logiteam << 'Problems initializing TESSearcher.' << erdl.,
Alvessuppex(teSearcher-getErrbeg());
// post a message to relect the error (code 0) and end the dialog
if (userNantSTOGARE) -- false)  $\ensuremath{\mathcal{H}}$  if we had problems loading in any of the data, end the dialog. if (logstream)

Postwessage (TDSG\_INIT\_DONE, 0, 0L);

\*logStream << endl << endl << "Initializing the TDSSearcher." << endl;

if (logStream)

note that in the function below, we do not post a message to make the dislayed of if the user/anterioCarcel has been set to true. In this case, the disloy will end via the GII thread, incidiong: indestructure in this case.

allocate a new TDSSearcher object and set its stop variable to our stop variable

or or Dissertors or Dissertors (logistram);
tdssartor - setStopwirthaleAdfress(auserkantsToCancel);
tc - tdsSartor - setStopwirthaleAdfress(auserkantsToCancel);
if (userkantsToCancel - setSet) {
 if (rc - tales) {

if it is still running

wait for the intialization thread to finish, otherwise the disalg vill erd, and the stop variable that the searcherfult thread is using vill become invalid nate(0) - initimeablendie.

// InitDialog.cpp : implementation file

if (inicThreadMandle !\* 0) {
 NaitForMultipleCbjects(1, lpHandles,

Dialog::OnCancel();

FALCE, INPINITE);

rr . true;
// pour a musage to reflect the error (code 1) and end the dialog
if (werefunctionerd) == false)
if (werefunctionerd) == false)
Poutbessage (TMSO\_RHT\_DASE, 1, 01);

if (logstream) 'logiciam' of ToSSearther canceled.'  $\alpha$  end),

// tell the searcher that the stop variable is no longer valid tdsSearcher-seatStopVariableAddress(MILL); initThreadMandle = 0;

return rc;

Page 1 of 2

set the title specially for the developer version

Oialog::OnlnitDialog();

```
return TRUE; // return TRUE unless you sat the toous to a control
// EXCEPTION: OCY Property Pages should return FALSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LRESELT InitDialog::WindowProc(UINT massage, WPARAM wharam, LEARAM IParam)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       m. StatusStatic. SetWindowText ("Shutting Down - Please Stand By"); OrLancel ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // separate function than OrCancel to differentiate between when the function between values of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate of the separate o
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  InitDialog 'dlgPtr = (InitDialog ')pParam;
initThreatHandle * initThread-xm_nThread;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Uliff Searcher_init_thread_func( LPADID pParam )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       dlyPtr->doSearcherInic();
teturn 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    el Se
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Osimfiread 'inicThread; inicThread - KrabejimThread(IAX\_TREBOPRIC) searcher\_inic\_thread\_func, (LPVOID) this, DREBO\_RIORITY\_KRABL

SetKindowText ("TDS - Name Search System - Developer Version");

start a thread to unitialize the tduSearcher object

INITDI-1.CPP 3-24-98 12:14p

Page 2 of 2

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BEDDI PERSONE PAR (PARTEDIS). COLALOS)

(I (LIAZ MAS) PAR (PARTEDIS)

(I (LIAZODICE PARTE LE PARTE) WATEN, CARTAR-LOSTITE-BATECO)

OR BI CLICCODICE PARTE LOSTE, MAINTS YORE, RADIO, CARLICISTE-PARTEDIS PARTEDIS 
IN CORTON (DAT. INC. VORE., PACTO, ENT., a., woods Pactored it!);
IN CORTON (DAT. INC. VORE., PACTO, ENT., a., woods seemabilit;)
IN CORTON (DAT. INC. VORE.) BY THE SERS, ENT., a., are are the distribution in Corton (DAT. INC. VORE.) ENT. IN ENESTE ENT., a., are are the contribution; IN CORTON (DAT. INC. VORE.) ENT. a., are altered to the contribution of the contribution of the contribution of the contribution of the contribution of the contribution.

IN CORTON (DAT. INC. INC. PACTO, ENT., a., and altered to the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribution of the contribu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    m_editDistPactorEdit.GetWindowText(numString, 100);
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(M. Nay May, per Remealig)

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                                                                                           // Farmsblg.cpp : implementation file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tankerParms * aParmsCbject;
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Mwadel THIS_PILE
Static char THIS_FILE() * _FILE_;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         #include "stdafk.h"
#include "TDS.h"
#include "ParmsDlg.h"
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nemebitidistihresh = (float)atofinastriap);
if (inemblitisfihresh > 0.0) | (inemblitisfihresh > 1.0)) |
Abressapbat(The name edit distance threshold sust be beceen 0.0 an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AlxMessageBox("The Ranker VI.R threshold must b
                                                                                                                                                                                                                                                                   make sure the ranker upper and lower thresholds and the VLR th
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AframessageBox ("The Ranker High VLR threshold must be b
                                                                                                                                                                                                                                                                                                                                                                                                              AfxwessageBox("The Ranker Low VLR threshold must be between 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       m_rankerHighVLRThreshEdit.GetWindovText (namString, 100);
rankerHighVLRThreshold = [float]atof(namString);
if (trankerHighVLRThreshold < 0.0) || (rankerHighVLRThreshold
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 m_rankerVLRThreshEdit.GetWindowText(mumString, 100);
rankerVLRThreshold * (float)atof(numString);
if (!rankerVLRThreshold * 0.0) || (rankerVLRThreshold
                                                                                                                                                                                                                                                                                                     ( (checkfarRankerData())
                                                                                                n_nameEditDistThreshEdit.GetWindowText (numString, 100);
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else
                                  rc . false;
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                                                                                                                                                                                                                                                 else
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                                                       - 13
                                                                                                                                                                                                                                                                                                                                                                                                                                           ., 0 and 1.0 inclusive");
                                                                                                                                                                                    ., d 1.0 inclusive");
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                                                                                                                                          // ??? check threshold values for group, name and ranker me groupsilioisThresholds. Celebracher (immString), 100); groupsilioisThresh + (Ifout) and fundition; if (IgroupsidioistThresh + 0.0) || (groupsidioistThresh + 0.0) ||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     m_spelling2FactorEdit.GetWindsAfext (namString, 100);
spelling2A: (floatiacofnumString);
if (spellingist c 0.0) (AfdescageBox("The Spelling 2 "He must be >= 0");
AfdhescageBox("The Spelling 2 "He must be >= 0");
                                                                                                                                                                                                                                                                                                             m_gpulling|PectorEdit_CerwindbaText (nandtring, 100);
spelling|We - (float)atof (nanString);
if (spelling|We < 0.0) {
ACAMESGREM("The Spelling | We must be >= 0");
rr • false;
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syllableWt = (floxt)stof(funString);
if (syllableWt = 0.0) {
if (syllableWt = 0.0) {
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if (commit < 0.0) ("("(")") ("(")");
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m_logFiletmebdir.GerWindowText (logFileNeme, 1000);
m_watchtkmebdir.GerWindowText (watchtkme, 100);
                                                                                                        bresk;
                                                                                                                                                                                                                                                                                                                                                                                                                           }
break;
                                                                                                                                                                                                                                                                           break;
                                                                                                                           case 2:
                                                                                                                                                                                                                                                                                                  case 3:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     case 4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          case 5:
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el Se
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AndressageBox("The group edit distance threshold

.. nclusive");

ckfatRankerData())
 rankerParms-setSpelilMr(spellinglHt);
 rankerParms-setSpelilMr(spellinglHt);
 rankerParms-setSpellMr(spellinglHt);
 rankerParms-setSyllableHt(syllableHt)

rankerParms->setPhoneticAt(editDistWt) rankerParms->setLeadConsWt (leadingCons

rankerParms ->setVowelMt (vowelMt); rankerParms ->setCultureMt (cultureMt); rankerParms ->setBias(m\_useLeftBias);

rc . talse;

Page 2 of 4

PARMSDLG.CPP 3-24-98 12:14p

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if [postRankerBPtche == TDS_BP FACE_LOUS]
else if [postBankerBPche == TDS_BP FACE_STADLS]
else if [postBankerBPche == TDS_BP FACE_STADLS]
else if [postBankerBPche == TDS_BP FACE_RBES]
else if (postBankerBPche == TDS_BP FACE_RBES)
selectid = TDC_BP ENT_DIST_ADMST_TREE_RADIO;
GwedRadioBatten(IDC_BP_ENT_DIST_ADMST_TREE_RADIO,
GwedRadioBatten(IDC_BP_ENT_DIST_ADMST_NOWE_RADIO, IDC_BP_ENT_DIST_ADMST_TREE_RADIO,
else if (postBankerBPche == TDS_BP FACE_RBES)
selectid = TDC_BP_ENT_DIST_ADMST_NOWE_RADIO, IDC_BP_ENT_DIST_ADMST_TREE_RADIO,
elsectid = TDC_BP_ENT_DIST_ADMST_NOWE_RADIO, IDC_BP_ENT_DIST_ADMST_NOWE_RADIO,
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// disable the fat ranker radio butcons
if (predaukerBhoods - Tm2.8g - FCDS; DNE)
if (predaukerBhoods - Tm2.8g - FCDS; DNE)
m_postCankerEditDist-dojustNoreBadio Bable(into-(FALSE);
m_postCankerEditDist-dojustNoreBadio Bable(into-(FALSE);
m_postCankerEditDist-dojustNoreBadio Bable(into-(FALSE);
                                                                                                                                                                                                                                                                 sprint(numString, *1.20", rankerParms-yetPhoneticMt());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sprint(nmString, *t. 2f*, rankerPame-spetOulturekt());
m_cultureFactorEdit.SetWindowText(nmString);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   n_letaunertoovikinnessiäti. Setkirioonet inmistrioji.
pprint (innistrioji, 10. 21. retaunertajalikultimeehold)
n_tetaunertigivikultimeeholti. Setkirioonet (innistrioj);
sprint (innistrioj, 10.21.; tatkankeriultimeehold);
sprint (innistrioj, 10.21.; tatkankeriultimeehold);
sprint (innistrioj, 14.; tatkankeriultimeehold);
sprint (innistrioj, 14.; tatkankeriultimeen);
n_tatkankeriuskimeepiit, Setkinkonnessi;
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selected in CD DIN 1951 ADDITED NORE ADDIO;
else if (predatablede in TDS BF ADDE STALLE)
selected in CD DIT 1957 ADDITES BRAZE (ADDIO);
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else if (predatablesterblede in TDS BF ADDIO);
else if (predatablesterblede in TDS BF ADDIO);
CD=CDAGDIGBRACEROCLE IN DIST, ADDIOT NORE ADDIO;
CD=CDAGDIGBRACEROCLE IN TOTAL ADDIOT NORE ADDIO;
CD=CDAGDIGBRACEROCLE IN TOTAL ADDIOT NORE ADDIO;
CD DIT 1957 ADDIOT NORE ADDIO, INC. DIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sprint(mumString, "10.2f", fatRankerLowLRThreshold);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // set the log debug into check box if it is set it (n_logbebuginto)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                m_rankertosvilkihrashbite.Serwindosvient (mastring);
sprint(nanstring, *10.2f*, rankertlighViRhreshold);
m_rankertlighViRhreshbiti.Serwindosvient (nanstring);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sprintf(numString, "10.2f", rankerLow/LRThreshold);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   sprint (numString, "10.21", groupEditDistThresh);
m_groupEditDistThreshEdit.SetWindowText (numString)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             m watchlameEdit. SetWindovText (watchlame);
sprint (numString, "%0.2%", nameEditDistThresh);
m_nameEditDistThreshEdit. SetWindovText (numString);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      check the appropriate PreRanker-BF method
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sprintf(numString, "t0.2f", rankerVLRThreshold);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     m_rankerVLRThreshEdit.SetWindowText (mrmString);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          m_logFileNameEdit.SetWindowText(logFileName);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (fatRankerktuokams < 0) {
AtAMessageBox("The Fat Ranker mux names value mist be greater than 0")
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    if ((tatEunkerHighURThreshold < 0.0) || (tatEunkerHighVRThreshold > 1.0)) |
        Atweesagebax("The Fat Ranker High VIR threshold must be between 0.0 and 1.0 inclusive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if ((fatRawkerVLRThreshold < 0.0) || (fatRawkerVLRThreshold > 1.0)) |
AladessageBox("The Fat Ranker VLR threshold must be between 0.0 and 1.0 inclus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           make sure the fat caster upor; and lower thresholds and the VIR threshold are valid. Only find an error if the postbaseBibble, is set to carefully besides 100s. This way we can save the values victous prementing them from closing the dialog. The values will not be used until the come back time the dialog and charge the postbankenBibble to something besides TITLS if YALE, IME.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        n_atalanderLoof(IMThreshibilit Cerbitedorfoxt (namitating, 100);
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rc = TRUS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sprint(numString, *1.2f*, rankerPains-sgetSpellikt());
m_spellingFactorEdit.SerWindovText(numString);
sprint(numString, *1.2f*, rankerPains-sgetSpell2kt());
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDialog::OnInitDialog();
char numString(30);
                                                                                                                                                                                                                                                                                              Putmoblg:.cusckFatRankerData()
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                                                                                                                                                                                                                                                                                                                                                                                                         rc • crue;
numString[100 • 1];
                                          Oblatog::OnOKU);
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, 12 (rc)
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PARMSDLG.CPP 3-24-98 12:14p

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same for post ranker - except disable the pre-ranker radio but
                                                                                                                                if (post-wover804 a.e. 105 ser prose prose)
in predavkers bit bit schipsus-baddo. Debal elindon (FMLSE);
in predavker bit bis addynatis in pledatio. Debal elindon (FMLSE);
in professiver bit bis addynat Three baddo. Debal elindon (FMLSE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ritum TRUE; // return TRUE unless you set the focus to a control // EXCEPTION: OCX Property Pages should return PALSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LAESINIT ParmeDly::WitkswProc(Ulff message, WPARAM wParum, LPARAM lParam)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    predaukuri8Mbabe = TDS_BB_MOSB_TRBEE;
// dicable the other radio butcors
procedurerEditolstAljustNoreBadio_Dabledirdow(FALSB);
m_pastRaderEditolstAljustSingleBadio_Dabledirdow(FALSB);
m_postRaderEditolstAljustSingleBadio_Babledirdow(FALSB);
m_postRaderEditOlstAljustThreeBadio_Babledirdow(FALSB);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    probances - 102, gr. MXE_SIRIE;
// disable the other radio buttons
poscamentalitistal/justfensbadio. Daablefindor(FALSB);
m_poschamentalitistal/justfensbadio. Daablefindor(FALSB);
m_poschamentalitisistal/justfinglebadio. Daablefindor(FALSB);
m_poschamber Bitchistal/justfinglebadio. Daablefindor(FALSB);
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// evable the other radio battoms
pregulaver(bitCitatAdjuntkoneRadio_Dabblevintow(TRUB);
m_portRamber(zittDistAdjuntkoneRadio_Dabblevintow(TRUB);
m_portRamber(zittDistAdjuntKongladio_Dabblevintow(TRUB);
m_portRamber(zittDistAdjuntKongladio_Dabblevintow(TRUB);
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post Rankes Bracae • TRZ_BP_MADE_NAGE;
post Rankes Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bracae Bra
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    _____(atRankertlighVLRThreshEdit.EnableHindow(FALSE);
    _____(atRankertNxNamesEdit.EnableHindow(FALSE);
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{
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PARMSDLG.CPP 3-24-98 12:14p

Page 4 of 4

void ParmsDlg::OnPrEditDistAdjustSingleRadio()

preRankerEditDistAdjustNameRadio.EnableWindow(FNLSE); postRankerSPNode - TDS BP MOS STATER;

m predanteration study outbroaded to bank definate (FALSE);
m predanteration study desting teach or bank definator (FALSE);
m predanteration study desting teach or bank definator (FALSE);
m, defaulter outbritten shall to habite definator (FALSE);
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a\_teranta-Tribuestatii. Esablekindo (TRUE);
m\_teranterio-Virtherestatii. Esablekindo (TRUE);
m\_teranterio-Virtherestatii. Esablekindo-UTRUE);
m\_teranterio-UTRUE;
m\_teranterio-UTRUE;
m\_teranterio-UTRUE;

void ParmsDlg::OnPrEditDistAdjustThreeRadio() postRankerBRNode = TDS\_BP\_NODE\_THREE;

prefanterEtitDistAdjustSingleRadio.BrahleWindow(FMASE);
 prefanterEditDistAdjustThreeRadio.BrahleWindow(FMASE);

Page 1 of 1

STDAFK.CPP 3-24-98 12:14p

// state.op : source tile that includes just the standard includes
TIS par all be the per-compiled beaker
// state.ob ill contain the pre-compiled type information
// Cupright (Gl 1998, Langage Analysis Systems Inc.

#include "stdafx h"

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// Call this when using MFC in a shared DLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // Call this when linking to MFC statically
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BUILTH PESSACE MENCITCHAPD, OHINAPD)

//[LAX MCITCHAPD]

// INTE - the Classificant will add and recove mapping mucros here.

// INTE - the Classificant will add and recove napping mucros here.

//|Max_MCITCHAPD on the Test of the properties of generated code!

//|Max_MCITCHAPD or the properties of the properties of generated code!

REMERSACE_MAD (
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// Standard Initialization
// If you are not usus Other features and vish to reduce the size
// or your final meeticable, you should remove from the following
// the specific initialization routines you do not need.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \frac{\partial f}{\partial t} ( \frac{\partial f}{\partial t} ). The code here to hardle when the dialog is // dismissed with 0%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // TLUO: add construction code here,
// Place all significant initialization in InitInstance
// TDS cpp : Defines the class behaviors for the application.
// copyrides for the
                                                                                                                                                                                     Copyright (C) 1998, Language Analysis Systems Inc.
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m_prinked = kdg;
in rRespanse = dig.Dokolal();
if (rRespanse == LOOK)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                #itdet_AFDGLL
Enable3dControls();
                                                                                                                                                                                                                                                                                                          #include "stdafx.h"
#include "TDS.h"
#include "TDSDg.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CIDSApp:::CTDSApp()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CTDSApp theApp:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Intidet DEBUG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                #endif
```

// Since the dialog has been closed, return FALSS so that we exit the // application, rather than start the application's message pump. return FALSE:

Page 1 of 1

TDS.CPP 3-24-98 12:14p

 $^{\prime\prime}$  TUXO: Place code here to handle when the dialog is

else if (nBusponse \*\* IDCANCEL) {

```
// Classifizard generated virtual function overrides
//{[ARV_VIRTUAL(CAboutD)g]
// (ARV_VIRTUAL(CAboutD)g)
// (ARV_VIRTUAL(CAboutD)g)
// (ARV_VIRTUAL)
/// (ARV_VIRTUAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return TRUE, // return TRUE unless you set the focus to a control // EXCEPTION: OCX Property Pages should return FALSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Obialog::Dobtabuchange(pDX);
//[/fax_pdr_we/ObourDig)
DOX_Control (pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_uf_pdr_u
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{
                                                                                                                                                                                                                                                                                                                                                                                                                                                            void setBuildString(char *buildString)
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virtual BOU Ontnitbialog();
//) MAFY_MGS
EDIARE_PGSSAE_MM()
char m_buildString[200 + 1];
                                                                                                                                                                                                                                // Dialog Data
// (Dialog Data
// (Dialog Data)
cana ( IDO - IDO ABOUTBOX );
CStatic a DaildStringStatic;
// | ABX_DATA
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//{{ARY_MCG_MAP (ObboutD1g)
//}}ARY_MCG_MAP
BU_MCSSAGE_MAP()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         //{{Arx_data_listT(CaboutDlg)
//}}arx_data_dst
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                                  class Obcoutbig : public Chialog
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                                                                                            n
public:
CabourDlg();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // Implementation
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"A questies tha columns. If we specify a longth of

"" o, the code that actually uses this structure will

"" oct the longth to the minimum size repuired to display

"" the last."
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // definition of column for the list control
typobel struct {
    _Type *c_label;
    int c_stems;
    int c_stems;
} c_hesc;
}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // prototypes for threadel search functions.
Ultr court_search_thread_tunc( LPVOID pharon );
Ultr similar_search_thread_tunc( LPVOID pharon );
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Entire in DEBLINEA
Connectivity FILE
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enciuse "starts h'
eincluse "TOS.h'
eincluse "TOSOIG h'
eincluse "TOSOIG h'
eincluse "PermoDig.h'
```

{strcpy(m\_buildString, buildString); }

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// 12001g qpp : implementation file

Page 1 of 15

TDSDLG.CPP 3-24-98 12:14p

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if it is still ruming
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//([AFY_DATA_INIT(CIDSD]9) //([AFY_DATA_INIT(CIDSD]9) // \ensuremath{\mathcal{U}} in \ensuremath{\mathcal{U}} : the ClassWizard will add member initialization here
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // wait for the thread to finish the stop variable the chemise the dialog will be via the stop variable // that the searchefulic thread is using will become invalid. Individuelly convent/ykuninghteadkadle; (if convent.ykuninghteadkadle; of the search flykuninghteadkadle; (if convent.ykuninghteadkadle; of the search properties the search properties of the search propert
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // tell any numbing thread to stop processing
userWantsToStop = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                n_restrancount = 0;
currentlyRumingfliceadHarkle = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CTDSD1g::waitForThreadToFinish()
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delete tdsSearcher;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           isSortAscending • true;
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                                                                                                                                                                                                                                                                           דואם אדאם ציוא (//)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          void
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### TDSDLG.CPP 13-24-98 12:14p

CILCOL3::CILCOL9(Cerd\* pParent /\*\*NALL\*/)
: Colalog(CILCOL9::IDO, pParent)

ON SECTION INC. CLAM. RESULTS. BATTON, OCIDENTEBATION)
ON SETTING INC. CLAM. RESULTS. LISTVINE, OCIDENTEBATION)
ON SETTING INC. CLAM. RESULTS. LISTVINE, OCIDENTEBATION)
ON SETTING INC. CLAM. RESULTS. LISTVINE, OCIDENTEBATION)
ON SET CLAM. DOES NOT. SENTINE, STATINE, OCIONARCHE AND ON SETTING INC. SON. RESULTS. BATTON, OCIONARCHE AND ON SETTING INC. SENTINE, STATINE, OCIONARCHE AND ON SETTING INC. SENTINE, STATING, OCIONARCHE AND ON SETTING INC. SENTING INC. CANDERCE AND SENTING INC. SENTING CLASS. BADTO, ONSIGERIA RESULTS. OCIONARCHE AND SENTING INC. STATING CLASS. BADTO, ONSIGERIA CLASS SENTING INC. SENTING INC. SENTING INC. SENTING CLASS SENTING INC. SENTING Obialog::DonetaDechange (ptd);

// ((ktc, bro. pwe/forms))

DEC. Control (ptd. DC, LEED);

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DEC. Control (ptd. DC, STORIC, ROSS, 1901);

DEC. Control (ptd. DC, STORIC, // UNA ABOUTBOX must be in the system command raz ASSEXT([LMM\_ABOUTBOX & OWFFFO) \*\* UNM\_ABOUTBOX); ASSEXT(UTM\_ABOUTBOX < OWFFFO); CString strAboutMenu; strAboutMenu,LoadString(IDS\_ABOUTBOX); if (!strAboutMenu.LaBMpty()) // Add "About..." menu item to system menu. Overur pSysMeru • GetSystemMeru(FALSE); if (pSysMeru !• NULL) BETH JESTSATE, IND (TITESTI) 9. CDIA LOG)

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Q7 ME PADT Oialog::OnInitDialog(); BOOL CIDSDIg::OninitDialog() BOOL re . TRUE; END MESSAGE MAP()

Page 2 of 15

```
// make the Settings button invisible for user versions of the app #ifdet TDSD_USDB_UDBSION
                                                                                                                                                                                                                                                                                                                                                ** ARCH_RADIO);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (OICHA RADIO)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              . ICols;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    col_desc structure, set the width to the size or use

// column backer text.

tempirate = m_qenyeasttsiactti.GetStringeldthicol_desc(i).c_latel) + 12;

vc. or = tempirate = col_desc(i).c_width ? tempirate : col_desc(i).c_width;

m_qmenyResultatiatatct.IntertColumi(i, sive);

m_dmenyResultatiatatct.IntertColumi(i, sive);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      put up a spland dialog and wait until it returns. It will return it
the unor clicks on the carecul button in the spland dialog, or
if the infer thread ends (either because of an error; an successful
initialization.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             psychem. Appendentiff SERARICA);
psychem. Appendentiff STRING, IIM_ABOTIBOX, strabourhent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   get a pointer to the tdsSearcher object that the Initibialog allocated an initialized. We are responsible for deleting it. We need to delete it enter it the init failed or was conceiled, so that is why we make sure we astign it to our pointer variable regardless of the return code from DeMAIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    open up the log file to capture missages during the creation and initialization of the ranker.
                                                                                                                                                       // Set the icon for this dialog. The framework does this automatically // when the application's main vandow is not a dialog // return(in-from TMB): // Set big icon SetConim-licon, PALSB; // Set small icon
                                                                                                                                                                                                                                                                    4.1 aid the appropriate fields to the list control L. Lty to create an image list and acacciate it with the listoctal m listoleges Create (16, 15, ILC_COLOR4, 0, 1); Citrup bm;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // ausociate CimageList with ChistCtrl m.queryResultsListCtrl.SetImageList (fm_listImages, LVSIL_SMLL);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lm.LoadBitmap (IDB_LISTVIEW_BITMAP);
m_listImages.Add (&bm, RGB (192, 192, 192));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Live.mask - LWCF_EMT | LWCF_HIDTH | LWCF_TEXT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      initDialog(RUL, Glogstream);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              initResult . initDialog.DoModul();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tdsSearcher = initDialog.getSearcher();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    logarream.open(logFileName, los::app);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // insert columns in the list control LV_COLUMN lvc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         numString(100 + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           it (initResult -- LDOK) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cerpwidth;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Inithialog
```

Page 3 of 15

origheight, SW

//orighidth = orighidth < TOSC\_NAX\_SORDN\_WIDTH ? orighidth : TOSC\_PAN\_SORDN\_WIDTH; orighidth = orighidth < maxwirachwidthToSisplayAllCols ? orighidth : maxwirachwidthToSisplayAllCols ? orighidth : maxwirachwidthToSisplayAll

SecWindowPos (EundTop, 10, 50, origNidth,

enableControls (TRUE);

set this once, here, since it will not be changing with each query

:

TDSDLG.CPP 3-24-98 12:14p

-> P\_DRAMFRAME);

dont make the window widder than is needed to display

orighidth - GetSystemMetrics(SM\_CKFULSCREEN) - 50; origheight - GetSystemMetrics(SM\_CKFULSCREEN) - 40;

origheight;

IDC\_SPECIFY\_CL

CheckedioButton (IDC\_AUTO\_CLASS\_RADIO, IDC\_SPECIFY\_CLASS\_RADIO,

m\_cultureCombo.EnableWindow(FALSE)

el Se

.. RADIO);

call GetSystemMetrics to see how big we can make the window

m\_cultureCombo.BhableWindow(TRUE);

.. ASS\_RADIO);

IDC\_AUTO\_CLASS

CheckladioButton (IDC\_AUTO\_CLASS\_RADIO, IDC\_SPECIFY\_CLASS\_RADIO,

m\_cultureCombo.SelectString(-1, tdsSearcher->getOultureString(specifiedOult)); 

reflect the specified culture in the culture combo box

n\_caltureCorbo. Addit ting (tdsSearcher-spetCultureSt cring (TDS\_CULT\_AGID));
n\_coltureCorbo. Addit cing (tdsSearcher-spetCultureSt ring) (SG\_CULT\_AGID));
n\_coltureCorbo. Addit ing (tdsSearcher-spetCultureSt ring) (TDS\_CULT\_GURSEB));
n\_coltureCorbo. Addit ing (tdsSearcher-spetCultureSt ring) (TDS\_CULT\_GISPANC));

fill up the cutlure combo box with strings from the cultureStrings array

IDC\_S DMILAR\_SR

IDC\_EXACT\_SEAR

{ Grecolationuttor.Exact\_Space; Apple, IDC\_SIMILAR\_SPARCH\_Apple,

// retlect query mode on OII
if (query/mode == TOSC\_QUERY MODE\_SPHILAR)
Checkbadicherican(IDS\_EXACT\_SPHICAR\_)
Checkbadicherican(IDS\_EXACT\_SPHICAR\_SPHILAR\_SPHILAR\_SPHICAR\_)

tdsSearther->setStopVariableAddress(AuserMontsToStop); // make sure the search uses our default values sendParmsToSoarcher();

reflect max names to return on GJI sprint((nmString, "td", maxkmesToketumPerQues m\_maxkmesToRetumEdit.SetWindorText(nmString);

```
// set the title specially for the developer version
SetWindowText("TDS - Name Search System - Developer Version");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // The system calls this to obtain the cursor to display while the user drays
// the minimized window
IKINSOR CINSONS: GOODER/OREGICON()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Seramessage (Mr. ICONERASEBKCEO, (WEARAN) dc. GetSafeidc(), 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                  ceturn FALSE; // teturn TRUE unless you set the focus to a control
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // It you and a minimize button to your dialog, you will need the code below
if to diam the iron. For HF applications using the document/view model.
If this is automatically done for you by the framework.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ChaintDC dc(this); // device context for painting
                                                                                                                                                                        // m_querykameddic LimicText (TDS_MSV_1GMS);
m_querykameddic .SetFocus ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ChourDig dighbout;
dighbout: setBuildString(TIXG_BUILD_STRIUS);
dighbout.EcModal ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // Conter icon in client rectargle
int calcon • GetSystemMetrics(SM_CKICON);
int cylcon • GetSystemMetrics(SM_CKICON);
Owect rect;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GetClientRect(krect);
int x = (rect.Width() - cx(con + 1) / 2;
int y = (rect.Weight() - cy(con + 1) / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (Dialog::OnSysCommand(nID, 1Param);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                void CIDSDIg::OnSysCommand(VINT nID, LPARAM 1Param)
n_parmsButton, Showlindoù (SH_HIDE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      it ((nID & OXFFO) -- ILM_ARXUTBOX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     dc.Drawlcon(x, y, m_hlcon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CD1alog::OnPaint();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // Draw the icon
                                                                                                                                                                                                                                                                  {
Outcarce1();
                                                                                                                                                                                                                                                                                                                                                                                      logstream.close();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           void CTDSDIg::OnPaint()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (Islconic())
                                                                                                                       Begetit
```

TOSDLG.CPP 3-24-98 12:14p

sprintf(oultweString, " (%s)", tdsSearcher->getOultweString(TDS\_OUT\_ANG)); TOSG\_STRIUS\_RETREIVING\_NAMES\_FOR\_SDMILAR\_MATCH: statusHsg + "Retrieving names for Bdit Distance Filter"; TOSS STATUS RETRETVING NAMES FOR EXACT MATCH: status/sig = "Retrieving names for Exact Match Filter"; TDSG\_STATUS\_DOING\_SIMILAR\_MATCH\_SOAN: statusHog = "Looking for similiar match candidates"; case TDSG\_STATUS\_DOLIG\_ENAT\_MATCH\_SCAN: status/15g = "Looking for exact match candidates"; strcat(namePlusCultureString).cultureString);
m\_queryResultsListCtrl.SetItemText(0, 1, namePlusCultureString); // update the name field for the current query by
// anding the iddScarcher object what the culture of the query
// is, and appending that string to the name.
// InSSD18::updateCultureCurrentQuery() if (userWantsToktop == true) {
 m\_queryPasaltsListCrtl.SetItemText(0, 4, "Naltod");
 done = true;
 done = true;
 enableControls (TRUE);
 logatream << "Query Canceled by user: " << ertl;
}</pre> LRESULT CTDSD19::updateStatusForCurrentQuery(int statusId) { namePlusOultureString[TDS\_MOX\_NOWE + 100]; oultureString[100 + 1]; statusMsg = "Undrown Status Code"; statusMsg . "Waiting for query"; TIDSC\_STATUS\_SEARCH\_COMPLETED: LRESULT CIDEDIG::reflectResultsForCurrentQuery() m\_statusEdit.SetWindowText(statusMsg); break; done - false; \*status#sg; (statusId) default: Case return 0; recum 0; Switch char **5**00

return (HCLRSOR) a\_hfcon;

Page 4 of 15

```
these are results from the second phase, so
// start after where we left off from the first phase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // for indented name
set first 2 chars to a space for indent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                lvi.itcm - endindarborCurrentQuary;
// cropy the pointers to the result names (BuRiame *) to our vector
tdsbarcher-yerLebsilUdwesPosSimilarNetri(result/burns);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // fill up the list box with the hits we got.
if (tiret/weo/Dreamics) | // these are exect matches.
if (tiret/weo/Dreamics) | // these are exect matches.
// Scart at 1 since the backer is at location 0
Ind.litem * 1;
// court projecters to the result names Includent *) to our vector classearcher-speckenultiamesPurBacchatch(resultiblens);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // aid two spaces at beginning of the name so it gets indented stropy(templameString + 2, (LPCTSTR) (extResultNemm-sgetStr().c_str())); m_queryResultsListCxtl.SetItemPcxt(lvi.item, 1, templameString);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              display the group number of the name that was returned
                                                                                                                                                                                                                                                                                                                                                                                                    if (dome)
sprintf(numHitsString, "td hitd", numHits);
m_queryResultsListCrtl.SetItemTuct(0, 4, numHitsString);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      check image
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               blank image
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  *extResultName = resultNames[i];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           lvi.inage = 2; // bi
m_queryResultsListCtrl.InsertItem(&lvi);
numString[100 + 1];
numHits = tdsSeer
logString[1000 + 1];
                                                                                                                 numeric Forms (String (10);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nomest(alvi, 0, sizect(ivi));

Noi.mask - UMF_IEXT | LATE_DOGE | LATE_DABMe;

Noi.inaspe - 2;

Noi.inaspe - 3;

Noi.inatten - 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       int numbiamesTokpend = resultbames.size();
char tempkameString[TDS_MAX_NOWE + 10];
strcpy(tempkameString, " ");
//
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for (i * 0; i < numNamesToAppend; i**) {
    sprintf(numString, "id", lvi.iItem);
    lvi.pszText * numString;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        m_queryResultsListCtrl.SetRedraw(false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (extResultName->getIsExact())
lvi.iTmage * 3; //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              logstream << 'Hits To Follow:" << endl;
                                                                                                                                                                                              // user version uses 2 decimal precision #16424 TDSQ_USER_VERSION stropy (numeric/burnetString, "12.4f");
                                                                                                                                                                                                                                                                                                                   strtpy (numericFormatString, "12.2f");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                rector<ExtRName *>resultNames;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ext.RName
                                                                                                                                                                                                                                                                                       Helse
                                                                                                                                                                                                                                                                                                                                               #endif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          athread • AixBeginThread((AFX THREADFNOC)similar_search_thread_tunc, (LPVOID)t
                                                                                                                                                                                                                                  if ((quaryfhase -- 1) if (quaryfhob -- moc_oumay_mome_sDullAB))

// on are at the red of optase i, and we are approad to
// of phase 2, so update the matuus to that effect, and
// start the react thread, has include the narbar of hits
// tran phase 1 in the header.
// tumpbarenteanisfularCat((false /* not done */,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                quecyPhase ** 1 /* first wave of results ? */);
erwbl-Controls(TRUE);
done * true;
                                                                                                                           done - true; logitream << "Query processing stopped due to an error: " << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                queryPhase = 2;
logstream << "Starting phase 2 of the mearch: " << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // update the status to say we are done Peathersonge (TDSG_UPDATE_STATUS_SEARCH_CAMPLETED, 01);
                                                                                                                                                                                                                                                                                                                                                                                                                                    true /* first wave of results */);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           currentlyRuningThreadHandle = aThread-xm_MThread;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              voud CTDSDIg::flust@ukerRusultsToListCrl(bool dawe, bool firstNawOfResults) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // done
       (currentQueryStatus - TEG_QUEN_STATUS_BREE) | a_queryRealistianCttl.SetitemExt(0, 4, 'Errou'); esableControls(TRUE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // we must be done.
flushRankerResultsToListCtrl(true,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                release the resoures allocated for the query if - there was an error
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aThread;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // close the log file
logstream << "Query Has Exied " << erdl;
logstream.close();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     numHitsString[100 • 1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /* ??? commented out for now if (*watchklame !* BOS) outputWatchRebults();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GotoDigCtrl (&m_queryNameEdit);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CWinfflread
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the user canceled
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *. TIREAD_PRIORITY_LONMAL, 0, 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            - we are done
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ivi
                                                                                                                                                                                - F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // rel
// - tl
// - - tl
// - - w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                W ITEM
              e | 5e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ., his,
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Page 5 of 15

TDSDLG.CPP : 3-24-98 12:14p

```
// . store this so we know what to delete later
                                                                                  lvi.iftem,
(LPCISTR)(extResultName-spetStr().c_str()),
extResultName-spetNeightedScore());
// logging stuff print(logstring, 'tc Nid 1-30.30s N3.4f', extRemildeme-sgetisDouct() 7 'E' : ' ',
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tdsSearcher-sectNatdenesToReturnPerQuery(rouNbenssToReturnPerQuery);
tdsSearcher-sectOuturnPard(coll.classNatob., speciforGhalt);
tdsSearcher-sestToRadersPerde (preBabersPerMos);
tdsSearcher-sestProatRadersPhrode (preBabersPerMos);
tdsSearcher-sestProatRadersPhrode (proatPardersPhrode);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   float queryUR = calcVLR(queryName);
// calculate the VCL of the query name. If that value
// is >= rankerVLRThreshold, set the ranker threshold to
                                                                                                                                                                                                                                                                                                                                                                                                                // make sure the newly added hits are in the same order as the // the currently selected sort column and order sortHittens(entindexGonCurrentQuery);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // validate the query name, then get a list of responses,
// and add them to the list control.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   waitOursor;
prevCursor;
lvi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   waitCursor • LoadCursor(NJL, IDC_APPSTARTINS);
prevQursor • SetCursor(waitCursor);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            m_queryNamvEdit.GetWindowText(queryName, 100);
                                                                                                                                                               logstream << logstring << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      m_quetyRecultsListCtrl.SetRedraw(true);
Invalidate();
                                                                                                                                                                                                                                                                                       endindexForCurrentQuery - lvi.iltem;
                                                                                                                                                                                                                                                                                                                                       // log the number of hits
logstream << numblitsString << endl;
                                                                                                                                                                                                              lvi.iltem..;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 void CTDSDIg::doQuery()
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CTDSD19::CnOK()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        docuery();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HCURSOR
HCURSOR
LV_ITEM
                                                                                                                                                                                                                                                                                                                                                                                                                                          /// gpclling 2 some
if (radorfalme gat5pill2n() > 0.0) {
    paptint (namOcting, nameric@onatGring, oxtResultName.-getSpclling2Score());
    n_qouryMesoltsdisaCtrl.SetTemText(Dvi.item, 7, namGring);

                                                                                                                                                                                                                                 // cuit dist score
il (rawborbara-gerBonericht() > 0.0) {
    payint(InnStriag, namericBonniStriag, extResultWare-syerBonericScore());
    a_quer/ResultsListCrtl.SetLtenfoxt(Nvi.ittem, 5, namStriag);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // oyllable score
if framerpama.getbyllablek() > 0.0) {
print(framer-yestbyllablek());
print(framer-try, nameris-Ponnatitring, extRessiltkame-yestsyllableScore());
n_geury@exaltslistctrl.Setltenfext(Ivi.iltem, 0, nam6tring);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // overall score
sprint(inexpeciation);
sprint(inexpeciation);
sprint(inexpeciation)
sprint(inexpeciation);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TDSDLG.CPP 3-24-98 12:14p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                n_queryResultsListCtrl.SetItemText(lvi.iltem, 10, "N/A");
                                                                                                                                                                                                                                                                                                                                                                                          m_queryResultsListCtrl.SetItemText(lvi.iItem, 5, "N/A");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  m_queryResultsListUtrl.SetLedText(lvi.iltem, 6, "N/A");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   m_queryResultsListCtrl.SetItemText(lvi.iItem, 8, "N/A");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     m_gueryResultsListCtrl.SetItemText(lvi.iItem, 9, "N/A");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           m_quer/ResultsListCtrl.SetItemText(lvi.iftem, 7, "N/A");
                                                                                                                                                           // only the developer version gets the scores past the overall score mittake 'TOG_ICER_JASSICA
                                                                                                                                                                                                                                                                                                                                                                else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     }
else
```

m\_queryResultsListCtrl SetItemText(lvi.iItem, 11, numString)

m\_queryResultsListCtrl.SetItemText(lvi.iItem, 11, "N/A");

Hendif

tdsSearcher->getOultureString(extRepultNam

.. ture()));

m\_q.eryPesultsissCtrl.SetItemDext(lvi.iItem, 2, extResultName-sgetNameCode()); // display the culture of the name that was returned (e.g. which pipe) m\_per/ResultsListCtrl.SetlemText(lvi.ltem, 1, Page 6 of 15

```
waito
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        waito
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ??? I see no easy way to update the exact status of the search,
|// since the processing has been most away first the COL! be would
|// show to set up some sort of callback mechanism to alter the COL!
|// show that was going on in the working thread.
|// should represent the COL STATUS STATUS STATUS PRINEINDO_BASES_PAR_STATUS_MINIO, COL);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POSLIMESSAGE (TISG UPDATE STATUS MSC, TISG STATUS DOTHG EXACT MATCH SOW, OL);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // Ack the idsSearcher object for the query stats, so we can update
// the queryStats data struture for this query.
idsSearcher.>getQueryStats(queryStats);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // let the rest of the app know that there is no thread numing-
currently@nnuingfhreadGandle • 0;
return tt;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // post a message to reflect the results of the exact Search PostMessage(TDSG_UPPATE_QUERY_RESULTS_MSG, 0, 0L);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       do the coast searth. This reams doing a binary search of the groups it.e. at grains the attention that service the most of the groups match this search. Luckily, the groups has metic this speak of returning alls set of now editers. As the mass go through this set of now editers, retrains the name at the specified offset, and see (taking the IV rules) if this name is an exact phoritic metch with the query. CITEDIS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  function to do the second phase of the query. (Similar search)
Cocobject((km_querykameBilt);
logisteam << tüsseardar-sgetkrideg() << end);
logisteam.close();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           update the status to say we are doing the exact lookup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (tdsSearcher->searchForExactMatches() -- (alse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    waitCursor * LoadCursor(MIL, IDC_APPSTARTING);
SetCursor(waitCursor);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           m_queryResultsListCtrl.EnsureVisible(0, FALSE);
                                                                                                                                                                                                                                                                                                                                                                                                              SetCursor (prevOursor);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CIDSD1g::doSimilarSearch()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rc . true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HCURSOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             700
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            : rsor:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          = = <del>1</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        :::::: 🖁
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These - Arbesjambread (IAPA_TRESDM_ROC) exact_search_thread_func, (LPVOID) this,

These TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST TRESDM_ROCHEST T
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m_queryResultsListCtrl.SetItemData(0, (DMORD)queryStats);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   it (postandenshede := The aP ACOS (ACOS)

If (query/AL >= Acoshwer/Althreabold);

If (query/AL >= Acoshwer/Althreabold);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  update our query stats so that the user can see the number of
groups and the mumberof cultures searched
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tdsSearcher->setFatRankerThreshold(fatPankerLowUkThreshold);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  set the focus to the list box, since the query in query mus is now disabled. When the query is completed, the query edit control will be re-embled, and the focus set back to the control.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      now set the fat Rawer stuff unless we are not doing any post ranker adjustment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // add a line for the query into into the list cutil viaude * LVIP_DEAT | LVIP_DEATS.

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tdsSearcher->setFatRankerMaxdames(fatPankerMaxMames);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // set up a query info structure for this query
queryStats * new TDSSearcher::tds_query_stats_t;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          m_queryResultsListCtrl.SetTtemText(0, 4, "Morking");
erableControls(FALSE);
                        // convertign/untreached, conserves set it to
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// modestion/untreached were the same the searcher
// modest own quarte to be Tableachers opticitie
if queryful as tradect/untreached
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Postwessage (TDSG_URPATE_CLASSIFICATION_MSG, 0, 0L);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            currentlyRunningThreadHandle • aThread-xm_HThread;
                                                                                                                                                                                                                                                                                                                                                                     rankorParms.setThreshold(rankerHighVLRThreshold);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          rankerParms.setThreshold(rankerLowLRThreshold);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CULTERLOGUETYStatus . TDSC_QUERY_STRTUS_OK;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (cdsSearcher->submitQuery(queryReme))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    userWantsToStop * false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     queryStats->clear();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ivi. ISubitem . 0;
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else
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Page 7 of 15

TDSDLG.CPP 3-24-98 12:14p

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// undate the GII to say we are doing the similar to search Posturessage (TDG_UFDATE_STATUS_MSG, TDSG_STATUS_DOING_STATUS_MATCH_SCOW, OL);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /// nake sure the results list control does not go past the botton
// or right edges. Leave space for the status bar.
m_qouryResultsListCtrl.GetWindowRect (&controlRect);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // keep the status text field at the bolton and the romining // width of the window, leaving room for the exit button. m_statusEdit (GerWindowRest (#controlRest); }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TDSDLG.CPP 3-24-98 12:14p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       )/ let the rest of the app know that there is no thread running currently
funningThreadMandle  

 • 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // post a message to reflect the results of the Similar Search
PostMussage(TIXG_UTDATE_QUERY_RESULTS_MSG, 0, 0L);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if there was a problem, set the status so that the error will be reported when we post the message to update the GIT. Also, this will prevent the second plass from executing.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        update the state for this last phase of the search
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                controlRect.lett = 5;
controlRect.right = pageRect.right = 5;
controlRect.botton = pageRect.bottom = 15;
m_queryResultstistCtrl.NoveNindow(scontrolRect);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                windsweidth - pageRect.right - pageRect.left;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (tdsSearcher->searchPorSimilarMatches() ** (alse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         currentQuer/Status - TDSG_QUERY_STATUS_EB80R;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // keep the status label the bottom m_statustabel.GetWirkbwRect(AcontrolRect); ScreenToClient(AcontrolRect);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       controlRect.right = pageRect.right - 70;
controlRect.top = pageRect.butcm - 22;
controlRect.butcm = pageRect.butcm - 2;
m_statusEdit.MoveWindow(controlRect);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            get the rect we have to work with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        controlRect.top • pageRect.bottom • 19,
controlRect.bottom • pageRect.bottom • 2,
m_statuslabel.MoveWindow(&controlRect);
)
waitOursor • LoadCursor(ULL, IDC_APSTDATING);
SetOursor(waitOursor);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               it (m_queryResultsLisdCrtl.m_hMrd !* MJL)
GRecc pageRuct;
Gket controlRect;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     wid CTEOlg::Orsize(Unf nType, int ex, int ey)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // update the stats for our interpretation to the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of the transfer of 
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GetClientRect (ApageRect);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (Dialog::OnSize(nType] Cx, Cy);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             return rc;
```

// keep the save results button at the bottom, // 13 be width from the left side an eavelmenteabatron. Getdindweet (controllect); Screenfoclient (controllect);

controlRect.left \* windowHidth / 3;

controlRect.right a controlRect.lett a 70; controlRect.top a pageRect.bottom - 55; controlRect.bottom - pageRect.bottom - 30; m\_aaveRealItsButton.MoveMindon(EcontrolRect); m\_aaveRealItsButton.MoveMindon(EcontrolRect);

\_\_clearResultsButton.MoveWindow(&controlRect);

controlRect.left = controlRect.right < 70; controlRect.top = pageRect.bottom < 55; controlRect.bottom = pageRect.bottom - 30;

// keep the clear results button at the bottom, and about // 2/3 the width from the left side m\_clearQuastect(econtrollect); Screenfoction(controllect); controllect.right • (windowlidth • 2) / 3;

// keep the exit button at the bottom and to the right nextButton.GetWindowRect(&controlRect);

Screenfoclient (scontrolRect);
controllect, botton - 22;
controlRect, botton - pepshect, botton - 23;
controlRect, left - pepshect, right - 60;
controlRect, left - pepshect, right - 2;
m, exitenton, browshind-(scontrollect);

// keep the legend static fleid at the bottom of the window m\_legendStatic.GetMindowRect(scontrolRect); ScreenfoClient(scontrolRect);

keep the legend bitmap at the bottom Bitmap.GetWindowRect(AcontrolRect);

Screenfoclient (controlRect); controlRect.top = pageRect.bottom - 22; controlRect.bottom = pageRect.bottom - 2; m\_legerdBitmap.HoveMindow(GcontrolRect);

controllect.top - pagefect.bottom - 19; controllect.bottom - pagefect.bottom - 1; m\_legenfStatic.MoveWindow(&controlRect); m\_queryResultsListCrct. DeleteAllItem();

Page 8 of 15

namitoms \* m\_queryNeaultstistCtrl.GetItemCourt();
for (int i \* 0: i < namitoms; i\*\*)
 queryStatafor \* TESSacriber::da\_query\_stata\_t ')m\_queryNeaultstistCtrl.GetItemCota(i);
if (queryNeart i \* MILL)
delete queryStatafor;</pre>

go through and look for header items. For each one we find, we must delete it's item data.

/ ¥

word CTDSDIg::OnClearResultsButton()

TDSSearcher::tds\_query\_stats\_t \*queryStatsPtr;

```
LRESULT CIDEDIG::WindowProc(ULMT message, NPARAM wParam, LPARAM 1Param)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (message ** TDSC_URDATE_CLASSIFFCATION_MGG)
return uplateOultureOurrentQuery();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             it (message == TDSG_UFDATE_STATUS_MSG)
return updateStatusForOurrentQuery (\( \text{Param} \);
                                                                                                                                                                                                                                                                                                  // the m_cultureCarde drop down should only be 
// activated if cultilastwic is set for the user 
// to specify the culture. 
if (cultilastwice) is culture. 
if (cultilastwice) is m_cultureCardo is mid-set 
m_cultureCardo DabaleHinder(reable); 
m_cultureCardo DabaleHinder(reable); 
m_unccl assistatio DabaleHinder(reable); 
m_unccl assistatio DabaleHinder(reable); 
m_unccl assistatio DabaleHinder(reable); 
m_unccl assistatio DabaleHinder(reable);
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LPPOINT lppc;
RECT rect;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               n_querytameEdit.BrableMindow(enable);
n_parm@atton.BrableMindow(enable);
n_aow@eoulteButton.BrableMindow(enable);
n_mastamsTdeetumEdit.BrableMindow(enable);
                                                                                     m_quer/Button. BrableWindow (enable);
m_clearResultsButton. BrableWindow (enable);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cancel button should be active when
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   m_specifyCultRadio.BrableWindow(enable);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          UNIT similar_search_thread_func( LPVOLD pParam )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // a query is going on.
m_cancelButton.EnableWindow(!enable);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           UIMT exact_search_thread_tunc( iPVOID pParam )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CIDSDIG *digPtr * (CTDSDIg *)pParam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CTDSD1g *d1gPtr = (CTDSD1g *)pParan;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      dlgPtr->doSimilarSearch();
return 0;
wid CTDSDig::erableControls(BOOL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       dlgPtr-xdoExactSearch();
return 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else
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TDSDLG.CPP 3-24-98 12:14p

"Number of query group "Murber of groups chec "Number of groups that "Number of candidate n queryStatsPtr->munGrou queryStatsPtr-»numGrou queryStatsPtr->numCand "Number of candidate r tdsSearcher- >getOultur queryStatsPtr->mmilian "Murcher of names with "Mamber of names that queryStatsPtr->mmQue querystateftr = (TOSSearcher::tds\_query\_state\_t \*)m\_queryfusultsissCtrl.GetltenOsta(index); if (querystateftr != NUL) { queryStatsPtr->numNa queryStatsPtr->numba sprintf (meg. "Cultures searched -> ts, ts \r" if (queryStatsPtr->numOulturesSearched -- 1)
 sprintf(mg, "Oultures searched -> 40\r" index \* m\_queryResultsListCtrl.GetNextItem(\*1, LVNI\_SELECTED); if (index :\* -1) { \*\* msg(2000 \* i);
TISSearcher::tds\_query\_stats\_t \*queryStatsPtr; \*> ames that passed similar edit distance ->  $td\rack tr$ ", -- ames retrieved from similar search -> %d/r" . idateNamesRetrievedFromSimilarSearch[0], •> matched exactly (phonetically) -> %d/r\* s for generated from query -> td\r" sThatPassedSimilarEditDistance(0); -> passed edit distance -> td\r\* -> ked by edit distance -> td\r" else ( .> exact mutch on group -> td/r" sWithExactMatchOrGroup[0], pocheckedMithEditDist(0), .» eString (TDS\_CULT\_ANGLO), -> psThatPassedEditDist [0], sThatMatchedExactly(0), -> yGroups [0],

// Set minimum width to current width // Set minimum length to current width

lppc (3) .x = 520; lppc (3) .y = 350;

 } return Chialog::WindowProc(message, wParam, lParam);

void CTDSD1g::OrDb1clkQueryResultsListview(NMSDR\* pAMSDR, LRESULT\* pResult)

// only the developer version gets query stats via a double click #lindef TDSC\_USER\_VERSION

irde:

lppc = (LPFODMT) IParam; // IParam points to array of PODMTS
GetWindowSect (Lrect); // Get current window size

Page 9 of 15

```
for (int i = 0; i < nunttems; i++) {
    querystatsrr = (IDSSearcher::tds_query_stats_t *)m_query@esuitstistCrtl.GetItemData(i)</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Text Files (*.txt)[*.txt|All Files (*.*)|*.*[[", MLL);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    fattankertowikflireshold = parmeDlg.getFatRankertowikflireshold();
fatRankertiighVikflireshold = parmeDlg.getFatRankertiighVikflireshold
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       manitom = m_queryResultsidstCtr1.GetItemCount();
TDSSearcher::tds_query_stats_t = queryStatsPtr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tempFileOpenDialog( FALSE, "txt", "QueryOutput.txt"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          arBankerVLRThreshold • parmsDlg.gecFatRankerVLRThreshold()
fatRankerMaxtemes • parmsDlg.getFatRankerMaxtemes();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (tempfileOpenDialog.Dowcdal() == IDOK)

CString outputfileName = tempfileOpenDialog.GetPathName();
                                                                                                                                                                                                                                                                                                                                                                                                                                 rankerHighVLRThreshold = parmsDlg.getRankerHighVLRThreshold
rankerVLRThreshold = parmsDlg.getRankerVLRThreshold();
                                                                                        paradig, set Pathatettovitimustoid (setankertovitimustoid) paradig, set Pathatestidyvitimustoid paradig, set Pathatestidyvitimustoid paradig, set Pathatestidyvitimustoid (setankertovitimustoid) set Pathatestivitimustoid (setankertovitimustoid); paradig, set Pathatestivitimustoid (setankertovitimustoid);
                                                                                                                                                                                                                                                           struy(logfiletems, parmedig, getLogfileteme());
logfebaginto - parmedig, getLogbeaginto();
struy(vletchtem, parmedig, getVetchtem());
nemedittidiethren, parmedig getVetmedittidiethren()
groupfaltidiethren - parmedig getGroupfaltidiethren()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        make sure the search uses these new values
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 preRankerBFMcde = parmsDlg.getPreRankerBFMcde();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (queryStatsPtr != NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OFN HIDEREADORCY,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OFN_EXPLORER |
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ofstream
outstream(outputFileName);
int
                                                                                                                                                                                                                                      it (parmsDlg.DoModal() -- IDOX) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               void CTDSD1g::OnSaveResultsButton()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               exact Char;
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                                                                                                                                                                                       "Number of groups that
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                                                                              "Number of names that
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                    Number of names with
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parmablą, set Logfal Jekame (Logfubaginko);
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parmablą, set Group klit Lojst Thruceh (group klit Lojst Thruceh);
                                                                                                                                                                                                                                                                                                                        -> arres that passed similar edit distance -> %d, %d\r",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     parmsDlg(MML. &rankerParms);
                                                                                                                                                                                                                                                                     .. amss retrieved from similar search -> 1d, 1d\r"
                                                                                                     .. matched exactly (phonetically) -> %d, %d\r*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   idateNamesRetrievedFromSimilarSearch[0],
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   iduteNamesRetrievedFromSimilarSearch(1)
                                                                                                                                                                                                               -> passed edit distance -> Nd. Nd/r" .
                                                                                                                                                                                                                                                                                                                                                                                                                                           => eString(quer/StatsPtr->secondCulture),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sThatPassedSimilarEditDistance[1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sThatPassedSimilarEditDistance[0],
                                               .. exact match on group ... td, td\r^*
                                                                                                                                                               -> ked by edit distance -> 1d, td/r*
.. generated from query .. ld, ld\r"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sWithExactMutchOsGroup[0],
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sWithExactMatchOnGroup[1].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          pscheckedWithEditDist(0),
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        void CTDSDlg::OnPaimsButton()
                                                                                                                                                                                                                                                                                                                                                                                  * eString (TDS_CULT_ANGLO),

    paThatPassedEditDisc[0],

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .. sThatMatchedExactly(1),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -> psThatPassedEditDist(1),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sThatMatchedExactly(0).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .. yGroups [0].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     *> yGroups(11,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   #endi (
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Page 10 of 15

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(IACTSTN) a queryReaultatistict of Cettombat (1, 7), (IACTSTN) a queryReaultatistict of cettombat (1, 8), (IACTSTN) a queryReaultatistict of cettombat (1, 9), (IACTSTN) a queryReaultatistict of cettombat (1, 10), (IACTSTN) a queryReaultatistict of cettombat (1, 10), (IACTSTN) a queryReaultatistict of cettombat (1, 11), (IACTSTN) a queryReaultatistict of cettombat (1, 12), (IACTSTN) a queryReaultatistict of cettombat (1, 12),
                                                                                                                                                                                                                                                                                                                     sprintf(outputLine, "tc %4.45%-30.308%-6.68 %-10.308 "
                                                                                                                                                                                                                                                                                                                                                                                                                                           uparchar, (Identina, quenyReaulatiantra, Gestrombox (i. 0), (Identina, quenyReaulatiantra, Gestrombox (i. 0), (Identina, quenyReaulatiantra, Gestrombox (i. 1), (Identina, quenyReaulatiantra, destrombox (i. 2), (Identina, quenyReaulatiantra, destrombox (i. 1), (Identina), quenyReaulatiantra, Gestrombox (i. 4)),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      monitamestrOseturnPerQuery - atol (namGtring);
if (inandmestDateumPerQuery - 1000)]

AtomessageBox (The max names to return value must be between 1 and 1000*);
rr - *false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Page 11 of 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          outstream << (LPCTSTR) outputLine << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              m_maxdamesToRecumEdit.GetWindowText(numString, 100);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            make sure max names is specified ok
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         queryAcde . TDSC_QUERY_MODE_SIMILAR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -> ed are from the drop-down list");
rc = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          queryMode - TDSG_QUERY_MODE_EXACT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // narrative paragraph number 4.1.1
bool CTDSD1g::validateQueryParameters()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           void CTDSD1g::OnSimilarSearchRadio()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      rc = true;
numString[100 + 1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       void CTDSDlg::OubxactSearchWadio()
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (rc) {
                                                                                                                                                                                                                                                                                                                                                                                                   ** "1-10.10s",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      char
                                                                                                                                                                                                                                                                                                 #el se
                                                 // Outure
outstreen << *Outure: * << (LPCTSTR)n_queryResultsListCtrl.GetlenToxt(i, 1)
<< entli
                                                                                                                                                                           // namber of hits
outstream << "Namber of Hits: " << (LPCTSTR)m_queryAesultsListCrtl.CetItemText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sprintf(outputLine, "tc 14.48 1-30.309 1-6.68 1-10.108 "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sprintflowcputLine, "%c %4,4s %-30.30s %-6.6s %-10.10s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sprint! (autputhine, "%c 14.45 1-30.305 1-6.65 1-10.305
                                                                                                                                                                                                                                                                                                 ec end) ec end);
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                   « end);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             outstream << (LPCTSTR) outputline << endl;
                                                                                                                                                                                                                                                                                                                               // only the developer version gets the full set of scores #stradef TLOG_USER_VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        exactChar . ';
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"Spell 1",
"Spell 2",
"Syllable",
"Vowel",
"Oulture");
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"Rule Set",
"Score");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Group",
"Rule Set",
"Score",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -1-10.10s 1-10.10s 1-10.10s 1-10.10s
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which query batch is this // 'A' for query header, '8' for Exacts, 'C' for non exacts
                                                                                                                        | ("3" -- "3") | ("4" -- "5") | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | | ("4" -- "5") | ("4" -- "5") | | ("4" -- "5") | ("4" -- "5") | | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") | ("4" -- "5") |
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // tirst make sure there is not a search in progress-
// he really about have a separate variable for this,
but we just check the size of the cancel buttom
// co make ante it is emabled
if (m_cancel buttom_IsWindowEmabled!) == PLASE) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                isSortAscending - TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sortedCol * phdn->iltem;
sortHitltems(-1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return ((float)namVowels / (float)len);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HD_NOTIFY *photn = (HD_NOTIFY *) pareDR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 editDistScore[20 + 1];
spell1Score[20 + 1];
spell1Score[20 + 1];
syllableScore[20 + 1];
ladCoreScore[20 + 1];
vowelScore[20 + 1];
cultureScore[20 + 1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   typedef struct tds_listcontents_tag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         batch; //
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group (20 + 11;
ruleSet (20 + 11;
score (20 + 11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        itemfype;
rank;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  *pResult . 0;
# #
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (!stromp(selectedOult, tdsSearcher->getOultureString(TDS_COLT_HISPAHIC)})
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               i (istrampiselectedAult, tdsSaurcher-spetOultureString(TDS_CMIT_CHINESE))) specifiedOult = TDS_CMIT_CHINESE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (!stromp(selectalOult, tdsSearcher-AgetOultureString(TDS_CULT_ARABIC)))
specifiedOult • TDS_CULT_ARABIC;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // make sure that the specified culture (what is in the edit portion of the // carbo bod, is one of the outhers in our culturestrings array.
m_culturechno Gevilmodrat (selectobalt, 100);
if (isterop(selectobalt, tudSearcher-setCaltureString(TDS_CMJ_AHJO)))
specifiedOhle - TDS_CMJ_AHJO)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | | now set the idaSearcher object so that it uses those | | new values | Next how we to past hew to past hew to past | new values | Next hew we can be we to past of the solid | | visit of since that utilished; with event he able to compute that until we get the query name. IdaSearcher-selectogethaplifoliogethaplifo
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   note that since we have already verified that the name is
                                                                                                                                                                                                                                                                                                                                                                                                                              cultClassMyde * TDS_CULT_MCDE_SPECIFY;
m_cultureCombo.EnableWindow(true);
       cuitClascHode - TDS_CULT_MODE_AUTO;
n_cultureCombo.BrableWindow(FALSE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              selectedCult(100 + 1);
rc = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tant crossing::validateOultureConto()
                                                                                                                                                                                                                                                                                                      void CTDCD1g::OnSpecityClassRadio()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             word CTDSDIg::sendParmsToSearcher()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               )
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          >
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at least 2 characters, we do not have to protect against a divide by zero.

CINCDIG::calcVLA(char 'queryName)

len = 0; numVoetls = 0;

void CTDCDig:.GrantoClassRadio() { .

TDSDLG.CPP 3-24-98 12:14p

Page 12 of 15

listCon entablock (i) .group (20] • '\0'; .strmcpy(listContentablock(i).ruleSet. [LACINTR]m_genyResultsListCt1.GetEtenPact (i.	.0	strncpy(listContentsBlock[i].score, (LPCISTR)a_queryResultsListCtrl.Getltenfext(i,	listContentsBlock(I)_score(20) • '\0';	105 ICM	stmcpy(listContentsBlock(i).editDistScore), (IPTSTRIM cheryResultsListCttl.GetItenfext(i.		listContentsBlock(i) editDistScore[20] • '\0';	stricpy (1186Contentsblock (1) .spilliboors, (IPCISTR) m_queryResultsListCt rl .GetItemPext (1,		listContentsBlock(i).spell1Score(20) = '\0'; strncpy(listContentsBlock(i).spell2Score,	(LPCTSTR) m_queryResultsListCtrl .GetltemText (i,	listContentsBlock(i).spell2Score(20) = '\0';	strncpy (listContentsBlock(i).syllableScore. (IATISTR)m pueryResultsListCtrl.CetItemText(i.		listContentSBlock [i].syllableScore[20] + '\O'; strncpy listContentSBlock[i].leadConsScore, strncpy listContentSBlock[i].leadConsScore,		listContentSBlock[i].leadConsCorre[20] = '\0'; strncpy[listContentSBlock[i].vowelScore,	ווערים וערים לתבו לאנים היידים ביידים וויידים ביידים וויידים ביידים וויידים ביידים וויידים ביידים וויידים ב	<pre>iistContentsBlock[i].vowelScore[20] = '\0'; strncpy(listContentsBlock[i].outureScore,</pre>	(LPCTSTR) m_queryResultsListCtrl.GetItomText(i,	listContentsBlock [i].cultureScore [20] • '\0';	// figure out which field is the basis of the sort, and also note		// ins value concern indicate was approximately if (sortedCol ** 0) {	<pre>sprint(listContentsBlock(i).sortField, "%4.4d", listContentsBlock(i).rank);</pre>	138CCORCERCEBIOCK(1).1850CLOSCERLING * 1550CLOSCERMING.	<pre>eise if (sortedCol == 1) {     strtpy(listContentsBlock[i].sortField, listContentsBlock[i].name);</pre>	<pre>listContentsBlock(1).isSortAscending = isSortAscending; )</pre>	else if (sortedCol ** 2) (	<pre>gtrtpy(listContentsBlock(i).sortField, listContentsBlock(i).group): listContentsBlock(i).isSortMscending = isSortMscending;</pre>	else if (sortedCol ** 3) {	listContentsBlock[i].isSortAscending - isSortAscending:	else if (sortedCol ** 4)	<pre>strcpy(listContentsBlock(i).sortField, listContentsBlock(i).score); listContentsBlock(i).isSortAscending * lisSortAscending;</pre>	-	Page 13 of 15
21, 201;	3), 20);		1 •> •), 20);	 		. 51, 20);			() () ()					1 *> 8), 20);	:	91. 201:		י זטני ייטני			#endif															
// only valid for query headers // must be big enougn for biggest field		specified by	ple queries,	lts within a	and creating a structure	placed in an array, and the array is sorted.  • list control and the sort structure is used		nly the first N rows	II to reduce the work required whan a new listoril, since the existing rows are already	rows are sorted.		bacchtten • 0:		templistViewItem;	namString[100 + 1];		Sourt () ;		[clamRows];		nev quety rystata • (TISSearcher::tds_quety_stats_c *)m_gpueryResultslistCtrl.Cetlc	-	1 NOTE:			VIF IMAGE;	templistviewitem. Naturem = v; templistviewitem. item = v; templistviewitem. item = v;	ige ** 3) // check mark			chtham; It gaffype;	listContentsBlock[i].rank * atoi([[PCTSTR]m_queryResultsListCtrl.GetItomText(i, 0]);	e, ' (LPCTSTR)m_queryResultsListCtrl.GetItemText(i,		no ; up, (LPCTSTR)m_queryResultsListCrt.GetItomText(i,	рр 3-24-98 12:14р
TDGGerCHF::LDG_query,Statc_t 'queryStats; chr sortField(50 + 1); bys  isSortNecending;	tds_11stcontents_c:	sorts the items in the list control by the column specified by sortexfol. The isSortAscending variable determines if the sort should	be ascending or descending. Since the list control contains results for multiple queries.	the sort needs to preserve the clustering of results within a	ay going through t	for each item. Each structure is placed in an array, and the array is sorted.	All the items are tenoved item the item cancion, a to re-populate the list control.	The numbers parameter allows us to specify that only the first N rows	are to be sorted. This is usefull to reduce the ware of results are added to the listers!, since the			tds_listcontents_t *listContentsBlock;	char	אפדו או	לעור . לעור	;	<pre>if (numbows == -1) numbows = m_queryResultsListCtrl.GetItonCount(); if (numbows) {</pre>		<pre>// allocate the data block listContentsBlock * new tds_listcontents_t[numRows];</pre>	for (i + 0; i < nambows; i++) {	// see if this is a new query ListContentsBlock(il.queryStats * ij (TISSearch	es embata(i);		itemfype - 'A';	else (	LumphistViewItem.mask = LVIF_INWGE;	templistviewitem. ilem * i) templistviewitem. ilem * i)	if (templistViewItem.iImage ** 3)	11 cm(1) = '6'; else	item()pe - 'C';	<pre>listContentsBlock[i].batch * batchthm; listContentsBlock[i].itemType = itgmType;</pre>	listContentsBlock[i].rank * atoi(	stricpy(listContentsBlock(i).name	1), 50);	istronkerthiotekis america) * vo ; strocpy(listContentsBlock(i).group,	TDSÓLG.CPP
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if (listContentsBlock[1].itemType == 'B')
templistViewItem.iImage = 3;
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Invalidate();
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eise if (sortenisalock(i).isSortenisalock(i).asortenisalock(i).isSortenisalock(
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listContentBlock[i].isSortAccerding + lisSortAscerding:
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strop(latContentsBlock(i).ortField.listContentsBlock(i).leadComsSocie;
strop(latContentsBlock(i).isSortDecoding = isSortDecoding;
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listContentsBlockii).isSortAscending • !isSortAscending;
                                                                                                                                                                                                                                                                                                                                                                         srcpy(listContentsBlocki).sortPield, listContentsBlock(i).spell1Score):
listContentsBlock(i).isSortAscending * lisSortAscending;
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listContentsBlock[i].isSortAscending = lisSortAscending;
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qport(listContentsBlock, numRows, sizeo([tdd_listContents_1), listItonContwieNumc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // check the type of the item to see if it is a query
it (listContentsBlock[i].item/pe = 'A')
templicityCestlean in page | 0;
templistViestlean in page | 0;
templistViestlean | 0;
manString[0] - 'Vo';
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // now delete all items (or the requested number)
// from the listuach (but do not delete the beaker's queryStats pointers)
for (i = 0; i < numbers)
m_queryBeaultaiAstCtrl.DeleteItom(0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   intint(numString, "1d", listContentsBlock[i].rank);
templistViewItem.pszText = numString;
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tor (i = 0; i c markow); i++) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                m_queryRosultsListCtrl.SetRedraw(false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    else if (sortedCol == 11)
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else
                             HITTORY TESS USES VENETORY
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#endit

(LPCTSTR) listContentsBlock(i).editDistScore)

(LPCTSTR) listContentsBlock(i).ruleSet);

(LPCTSTR) listContentsBlock(i) .group)

(LPCTSTR) listContentsBlock[i].name);

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templistViewIten.iImage - 2;

(LPCTSTR) listContentsBlock[i].score);

(LPCTSTR) listOmtentsBlock(i) .gpell1Score);

(LPCTSTR) listContentsBlock(i).spell2Score);

(LPCTSTR) listContentsBlock(i) .syllableScore);

(LPCTSTR) listContentsBlock[i] leadConsScore)

(LPCTSTR) listContentsBlock(i).vowelScore);

(LPCTSTR) listContentsBlock(il.cultureScore);

TDSDLG.CPP 3-24-98 12:14p

Page 14 of 15

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Page 15 of 15
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waitPorThreadToFiniah();

// need to do this so the space allocated for the query into
// set deleted.

OnClearRebutsButcon();

Chialog::OnCance();

this function gets called when the user clicks CIDSDIg::OnCancel()

// noid /

) return Olalog::FreTranslateNessage (pMsg);

else

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// Accibace

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// Operations

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// Classwizard generated virtual function overrides
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#itradef PACTONEDIT\_DEFFED #define FACTONEDIT\_DEFFED

Copyright (C) 1998, Language Analysis Systems Inc.

// FactorEdit.n . header file // Ccp/right (G) 1998, Lang FACTOR T.H 3-24-98 12:14p

Pa

```
getSearcher() {return tdsSearcher;}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INITDI-1-H 3-24-98 12:14p
#12 : cdetinca(AFZ_HNITDIALOG_H__86981901_9856_1101_9552_004005115887__INCLUED_)
identine AFX_DRITDIALOG_H__86981901_986C_1101_9552_004005115887__INCLUED_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Overrides
// ClassMitant generated virtual function overrides
// (LassMitantinitialog)
protected:
virtual void DADLabSchange(DATaBSchange* DX); // DX/DDV support
virtual INSSAIT WindowProc(UNIT message, MPARM vearam, IPMRM Peram);
/// JATA_VIRTUAL
                                                                                                                                                                                                                                                                                              *aLogStream);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         userMantsTbCancel;
initThreadWandle;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // Generated message map functions
// (lax_gestinuchae)gody
virtual Book onintibialogy);
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eran | Ito - Ito_INIT_DALGS };
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Copyright (C) 1998, Language Analysis Systems Inc.

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#endif // :defined(AFX\_DRTDIALGG\_H\_86981901\_955C\_11D1\_9552\_004005115887\_\_DRTAINED\_)

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// Next default values for new objects

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// MFC support for Windows Common Controls

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// Exclude rarely-used stuff from Windows headers

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// or project aprilic include tiles that are used frequently, but
// are changed infrequently
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// ClassWinard.crmSepp)
public:
virtual BOOL Intifretance():
virtual BOOL Intifretance():
// CTXZApp:
// See TDS.cpp tor the implementation of this class
                                                                                                 class CTIXAqp : public CAinApp
                                                                                                                                           f
public:
CTCSApp();
                                                                                                                                                                                                                                                                                                                                                                                                                         // Implementation
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// main symbols

Minclude "resource.h"

#it\_MCC\_VER >= 1000 #pragma once #endit // \_MCC\_VER >= 1000

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Copyright (C) 1998, Language Analysis Systems Inc. // TGC.h : main header file for the TES application // Gpyrught (C) 1598. Language Analysis Svetems TDS.H; 3-24-98 12:14p

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//{[AX_iNSBT_LCXTION]}
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// Classwisser generated virtual function overrides
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public:
virtual BOO. InitInstance();
// )Arg.VirtuaL
                                                                                                      class CTds_rankApp : public CMinApp .
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// cds\_cark.h : muin meader file for the TDS\_RAUT application

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#include "resource.h"

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105 QUERY MORE MACE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TUSG DEFAULT CLASSIFICATION SETTING
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TOS URANTE_CHARM FOR THE CLASSIFICATION WES THESU URANTE_CHARSIFICATION WES THESU UPDATE_CHASSIFICATION WES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // define some constants for status values needing TISC_STATUS_DOING_EXACT_MATCH_SCAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      dutine the detault query mode THOSE DEFAULT_QUERY_MODE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mpragma cace
Wendit // MSC_VER >* 1000
// TDCDlg n : headur tile
//
// Ccp/right (C). 1998
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                #1f PSC_75K >+ 1000
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Adetine
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```

\_\_\_actrl \_\_\_\_\_aperyNessitstistCri;
CZdit \_\_\_aperyNameIsit,
CZdit \_\_\_aperyNameIsit,
CZdit \_\_\_aparyNameIsit,

Cstatic m statusbdit; Cauton m carcelbuton; Cauton m querybuton; Cauton m clearResultsbutton;

CButton m\_similarSearchRadio; CStatic m\_statusLabel; CComboBox m\_cultureCombx

Obutton m\_autoClassRadio; Obutton m\_specifyOultRadio;

define how wide the main dialog needs to be to display all the listbox columns without having to scroll.

Acetine TDSC\_MAX\_SONERN\_WIDTH 680

class CTDSD1g : public CDialog

// Construction

CTDD1g(Obt\* pParent = MALL); // standard omstructor \*CTDD31g();

doExactSearch(); doSimilarSearch();

// Dialog Data
// {Ary Durh(CINSD)g)
erns | IID + IDO INS\_DIALOG };
GGatic m\_legendientic;
GStatic m\_legendientor.

ТВЅВСД.Н 3-24-98 12:14р

// Generated message map functions
//(Mry SectionStay)
virtual BOOL offinitialog();
afr.mg void OnSystCommand(UTM nID, LDARDAN IMarman);
afr.mg void Chabain();
afr.mg yould Chabain();
afr.mg void OnSise(ULM nIDpe, int cx. int cy);

protected:

// TIX/LDV support
strain load bolarabichunge (Unitabichunge pix);
// TIX/LDV support
strain laisin, Hinto-Proc(UDNT nessee, WRARM Wharm, LPADAM Ibram);
//// NAT. VIRTUAL
:

HICON m\_hicon; CimageList m\_listImages;

// Implementation
protected:

// ClassWizard generated virtual function overrides //{{Arx\_virtual.(CTDSD1g) virtual BOOL PreTranslateMessage(MSG\* pMsg);

SetRedraw( BOOL bRedraw);

bool doExatGroupSearch(); bool doEvzyGroupSearch();

```
//{AFX_INSEXT_LOCATION}}
// Microsoft Developer Studio vill insert additional declarations immediately before the previous line
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           #endif // :defined(AFX_TDSDLG_H_]EE210C8_3A8C_11D1_9548_004005115BF7_INCLUBD_}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                used to monitor which colum is sorted, and the direction of
the sort:
sort-decedible;
isSort-Accedib;
                                                                                                                                                                       rankerlowURThreshol
rankerHighVLRThresho
rankerVLRThreshold;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    some variables to support tracing/debugging
for the watch name
                                                                             thresholds for edit distances
                                                                                                                                                                                                                                                                                                                                                                                                  e_bf_modes preRankerBFNode;
e_bf_modes postRankerBFNode;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      m_redrawcount;
                            logstream
                                                                                                                                                                                                                                                                fat ranker info
                                                                                                                                                                                                                                                       //
float
float
int
                                                                                                                                                                    float
float
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            is user specifying culture, or shoul \boldsymbol{\mathsf{w}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          If user specified culture, whi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          struct for info about current query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     where in listbox does current query's
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          which phase is currently being worked on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      querytlame [100 + 1];
                                                                                                                                                                                                                                                                                                                                                                                                                               flushRankerResultsToListCtrl(bool done, bool firstMaveOfResults);
ate, and you unconsensationing.

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    make the queryName bigger than the max we will allow so that an explicit error message will be displayed if the name is too long.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mandamesToReturnPerQuery;
queryMade;
cultClassMode; //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       stuff to control the status of the current query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          specifiedOult;
                                                                                                                                                                                                                                         IAESULT uplateStatusForCurrentQuery(int statusId);
IAESULT reflectResultsPorCurrentQuery();
IAESULT uplateCultureCurrentQuery();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      endIndexForOurrentQuery;
                                                                                                                                                                                                                                                                                                                                     enableCentrols (BOOL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             earn screen dreny parameters
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       validateQueryParameters();
validateCultureComb();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sendParmsToSuarcher();
calcVLR(chur *queryName);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sortHitItens(int numKovs)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               waitForThreadToFinish();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         info about the query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // the searcher object
TDSSearcher
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          queryPhase;
                                                                                                                                                                                                                                                                                                                                                                                   doQuery();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        userWancsToStop;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       e_tds_culture
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    e_tds_culture4ode
```

// parme dialog stuff
RParameters rankerParms

log file info

void OrtoleikQuerykasultslistvier(IMER\* pIMER, IRESULT\* pResult); void OrbermsButton();

oid OnClearResultsButton(); oid OnCancelButton();

TDSDLG.H 3 24-98 12:14p

Page 2 of 2

## TDS\_Preprocessor

```
byte n = atoi(luf + 4);
if (*luf + 1) == ELANK & *(buf + 3) == ELANK & n >= 0)
n_(d_matrix(static_osst-byte=)buf(0))[static_osst-byte=)buf(2))] = n;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // first, out exact matches
// thirst, out exact matches
// there are is features and the file has the number of teature differences
// matchighled by 10
for (1 = 0; 1 < 256; 1++)
for (3 + 0; 1 < 256; 1++)
m_td_martix(1) 3 + static_castdayce>(1 -> j ? 0 : (15 + 1) * 10);
                                                                                         THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               int i, j:
char buf[BUFSI2]; // BUFSIZ is apparently defined in <stdio.h>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cornt bool Opprox::set_float_distances(corst char 'frame)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // now get the feature distances from the given file while ([_in.getline(buf, BUFSIZ))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // read a file of teature differences
const bool CApprox::Set_distances(const char *frume)
// approx.cpp: implementation of the approx class.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    winder DEBUG
wunder THIS_FILE
static char THIS_FILE() - FILE_;
whatine new DEBUG_NEW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           char 'p = strchr(buf, ';');
if (p != NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          •p = EDS:
if (strlen(Duf) •• 7)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       unsigned int x,y;
ifstream f_in(fname);
if (!f_in.good())
return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ifstream t_in(fnamt);
if (!t_in.gcod())
return false;
                                                                                                                                                                                                                                                                                                                                                                                                                           #include "stdafx.h"
#include «fstream»
#include "approx.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sing namespace std;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              f_in.close();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          return true;
```

//int i.j;
//char buf(BUFSIZ); // BUFSIZ is apparently defined in <stdio.h>

infile.close(); return true;

// use this to read in a file containing rec codes and their // associated distance scores corest bool Okprox:sel\_rec\_distances(cost\_char \*filename)

ifstream infile(filename); if (!infile.good()) return false; // first, set exact watches // first, set exact watches // pure are 15 features and the file has the nurter of feature differences // nuttiplied by 10 for (i = 0, i < 1556; i + ) for (i = 0, i < 156; j + )  $= \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \right) \right) \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \right) \right) \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \right) \right) \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \right) \right) \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \right) \right) \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \right) \right) \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1}{n} \left( \frac{1$ 

float n \* atof( (const char\*)buf \* 4); if (\*(buf \* 1) \*\* BLANK & \*(buf \* 3) \*\* BLANK & n >\* 0)

x = buf[0]; y = buf[2]; m fd\_float\_matrix[x][y] = n; }

f\_in.close(); return true;

while (f in getline (char\*) buf, BUFS12))

int i, j: unsigned char buf[BUPSIZ]; // BUPSIZ is apparently defined in «stdio.h-

Capright (C) 1998, Language Analysis Systems Inc.

return 1.0 - m\_diff / static\_cast-(loat>(\_max(m\_strt\_len, m\_strt\_len));
Page 1 of 6

APPROX.CPP 3-24-98 11:23a

const int Opprox::plain\_edit\_distance(const unsigned char 'variant. const unsigned char 'variant. flost secore)

int rc • plain diff(query, variant); score • get\_plain\_score(); return rc;

float CApprox::get\_plain\_score()

```
int to + threshold <- 0 ? enact_diff(strl, strl) : approx_diff(strl, strl); score + get_score(); return tc;
                                                                                                                                                                                                                                                    /* approx_diff

This is the classic edit-distance algorithm, the V.I. Leverahtein (or P. * Sellers) variant.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // note this version uses the values in the m_fd_natrix to check
// against the threshold. It does not actually do anything else
// with those values. (kra)
cornst int Gapricu:.approx_diff(corst unsigned char *strl,
cornst unsigned char *strl,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   d = m_dift_array(p_x - 2) (t_x - 2) + di + d2 + 1;
if (d < lowest)
lowest = d;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     unsigned char p_char • NIL; unsigned char c_char • NIL; int d • 0; int d1 • 0; int d2 • 0; int tinp 0.0 int ti • 0; // string indexes int p • 0 of int ti • 0; // string indexes int p.* 0; int c.x • 0; // difference-array indexes int lowest • 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for (pi = 0; (p_char = strl[pi]) !* BOS; pi**)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        d1 = char_eq(strl(pi - 1], str2[ti]) 7 0 : 1;
d2 = char_eq(str1(pi), str2[ti - 1]) ? 0 : 1;
if (d1 == 0 is d2 == 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for (ti = 0; (t_char = str2(ti)) != EOS; ti++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         P_x * pi + 1;

t_x * ti + 1;

f_ger rid of this

//// to x * NAWE_SIZE || t_x > NAWE_SIZE)

/// ALAMSSAGEBOX(*CAN'T IAPPEN');
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     d • m_diff_array(p_x - 1) (t_x) • 1;
it (d < lowest ) lowest • d;
// -- transposition
if (pi >= 1 &= ti >= 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            p_x = pi + 1;
r = rii + 1;
r = rii + 1;
r = rii + 1;
r = rii + 1;
r = rii + 1;
r = rii + 1;
r = rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + rii + 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // original implementation
// these functions handle character comparison using
// tenture distances to see if its above or balow a threshold
// calture distances to see if its above or balow a threshold
// calture distances to see if its above or balow a score based on difference and string lengths
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    d = m_diff_array[p_x - 2] (t_x - 2) + d1 + d2 + 1; if (d < lowest) lowest + d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       d1 = plain_char_eq(strl(pi - 1), str2(ti)) ? 0 : 1;
d2 = plain_char_eq(str1(pi), str2(ti - 1)) ? 0 : 1;
if (d1 == 0 && d2 == 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             и
тантинатинатинатинатинатинатина
                 waigsed one p_dhe - Mill.; unique does r_dhe r_dee = Mill.; int d=0; int di=0; int di=0; int di=0; int pi=0; int ci=0; // string indexes int pi=0; int ti=0; // difference-array indexes int lower: 0;
                                                                                                                                                                                                                                                                                                                                                       for (p1 - 0; (p_char - str1[pi]) !- 675; pi-- )
                                                                                                                                                                                                                                                                                                                                                                                                                                                     tor (ti . 0; (t_char . str2(ti)) != BOS; ti++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        d * m_diff_array[p_x][t_x - 1] + 1;
if (d < lowest ) lowest * d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    d • m_diff_array(p_x - 1] [t_x] + 1;
if (d < lowest ) lowest • d;
// ·· transposition
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                m_diff_array[p_x][t_x] = lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (pi >- 1 44 tl -- 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 m_strl_len • pi;
m_strl_len • ti;
m_diff • get_plain_diff();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 teturn m_diff;
```

const unsigned char \*str2, const int threshold, double &score)

court int Oppiox::plain\_diff(const unsigned char \*strl, const unsigned char \*strl)

age 2 of 6

m\_diff\_array[p\_x][t\_x] = lowest;

m\_strl\_len • pi; m\_strl\_len • ti; m\_diff • get\_difference();

return m\_diff;

APPROX, CPP 3-24-98 11:23a

ifferences
 One of the above vill be selected based on the desired abainst feature one of the above vill be selected based on the desired abainst humanide-each does a quick string compare instead of a more expensive calculation.

const int Opprox::differences(const unsigned char \*strl,

```
for (pi * 0; (p_char * arr1(pi)) !* EOS; pi++) // EOS is defined as '\0'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // this version uses REGs rather than IPMs
// this version uses the new float matrix
const int Opprox.:rec_differences forms unsigned char 'recluray's.

Const unsigned char 'recluray's.

(lost recComparray[256] [256].

double accore)
                                           d = m_dift_float_array(p_x - 2) (t_x - 2) + d1 + d2 + 1;
if (d < lowest)
lowest = d;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 int rc = approx_rec_diff(reckray1, reckray2, recCompArray);
score = get_rec_score();
return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    coust int Otypica::appira_rec_diff(const unsigned char *arrl, const unsigned char *arrl, thost diff_matrix(256)[256])
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for (ti = 0; (t_char = arr2[ti]) != 5DS; ti++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             и
панинания принавания принавания принавания предуставания принавания предуставания предуставания предуставания п
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return m_float_diff; // this is the number of differences \} // approx_diff
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unsigned clar p_char = NM1s, unsigned clar p_char = NM1s, int d = 0, int d = 0, int d = 0, int d = 0, int d = 0, int d = 0, int d = 0, int d = 0, int d = 0, if atting indexes int power d = 0, int d = 0, if difference-array indexes int lowest d = 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          f_out << m_diff_float_array[i][j] << '\t\t';
                                                                                                                                                                                  m_diff_float_array[p_x][t_x] - lowest;
                                                                                                                                                                                                                                                               m_strlen = pi;
m_strlen = ti;
m_float_diff = get_float_difference();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tor (int j = 0; j < NAWE_SIZE; j++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /*
ofstream f_out("damp.txt");
for (int i = 0; i < NOWE_SIZE; i++)
if (d1 - 0.0 &4 d2 - 0.0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                f_out << '\n';
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     f_out.close();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              АРРКОХ.СРР 3-24-98 11:23а
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       d1 * ctar_float_eq( (unsigned int)strl[pi - 1], [unsigned int)strl[ti]); d2 * ctar_float_eq( (unsigned int)strl[pi], [unsigned int)strl[ti - 1]);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // this version is used for generating the rec comparison scores
// it needs to call a different version of the score function
count float Opprox.rec_gen_float_differences(const unsigned dart 'sstr),
float_decore)
float_decore)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // incre this version uses the values in the m_fd_matrix const float Okprox::approx_float_diff(const unsigned char *strl, const unsigned char *strl)
                                                                                                                                                                                                                                                                                                                            const float Cuprox::float_differences(const unsigned char *strl,
const unsigned char *strl,
float &score)
                                                            и
попативнительная примененти примененти
                                                                                                                                                                                        инининининининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  unsigned that p_char = Mill; unsigned that c_char = Null; that d = 0.0; float d = 0.0; float d = 0.0; that the constance int p, x = 0; int t = 0; // string indexes int p, x = 0; int c, x = 0; // difference-array indexes float lowest = 0.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for (pi = 0; (p_char = str1{pi}) != EOS, pi++)
                                                                                                                                                                                                                       // value using implementation
// these functions handle character comparison using
// the feature values as the actual vales returned
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for (ti * 0; (t_char * str2[ti]) :* EOS; ti**)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    d \cdot m \cdot diff = float \_array[p\_x - 1][t\_x] + 1;
if (d \cdot lowest) \cdot lowest \cdot d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    float rc = approx float_diff(strl, str2);
score = gut_float_score();
return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  float rc * approx_float_diff(str1, str2);
score * get_rec_gen_float_score();
return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // -- transposition if (pi >= 1 && ti >= 1)
          // approx_diff
```

```
{\it H} this is the float version of the above function (yes I know about overloading)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for (pi = 0; (p_char = arr1(pi)) != BOS; pi++) // BOS is defined as '\0'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               const flost Opprox.::rsc_flost_differences(const unsigned char 'reclaray),
const unsigned char 'reclaray?,
flost recCompArray[356] [356],
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ! (lost re - approx_rec_flost_diff(rechray), rechray2, recomplarity);
score - get_rec_float_score();
return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ornst float Okprox::approx_rec_float_diff(cornst unsigned char 'arr2,
coust unsigned char 'arr2,
float diff_matrix(256) [256)
                                                                                                                                                                                                                                                        di - rec_eq(arzl(pi - 1), arz2(ti), diff_matrix) ? 0 : 1;
d2 - rec_eq(arz1(pi), arz2(ti - 1), diff_matrix) ? 0 : 1;
if (d1 -= 0 &= d2 -= 0)
d = m_rec_diff_array[p_x - 2] (t_x - 2] + d1 + d2 + 1; if (d < lowest)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for (ti = 0; (t_char = arr2[ti]) (= EDS; ti++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ининининининининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 unsigned clar p_char = NULL, unsigned clar p_char = NULL, float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float d = 0.0; float clare c = 0.0; float lowers = 0.0;
                                                                                                                     d = m_rec_diff_array[p_x - 1] (t_x) + 1;
if (d < lowest) lowest = d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             m_rec_diff_array(p_x)[t_x] + lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  m_strl_len = pi;
m_strl_len = ti;
m_rec_diff = get_rec_difference();
return m_rec_diff;
                                                                                                                                                                                // -- transposition
if (pi >= 1 && ti >= 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      p_x - pi + 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             lowest - m_rec_diff_array[p_x - 1][t_x - 1] + (rec_eq[p_char, t_char, diff_matrix) ? 0
                                                                                                                                  lowest = m_rec_diff_array[p_x - 1][t_x - 1] + (rec_eq[p_char, t_char, diff_matrix) ? 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for (pi = 0; (p_char = arrl[p1]) != DOS; pi++) // BOS is detined as '\0'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   court int Opprox...rec_differences(const_unsigned char 'recArtay),
const_unsigned char recArtay.
const_unsigned char recConstray[356] [356],
double facore)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   coust in Oupprox.:approx_sec_diff(coust unsigned char *arr).
coust unsigned char *farr, const unsigned char *farr, [136] [136]).
                                                                                                                                                                                                                                                                                                                                                                                                        dl = rec_eqlart[pi - 1], arr2[ti], diff_matrix) ? 0 : 1;
d2 = rec_eqlart[pi], arr2[ti - 1], diff_matrix) ? 0 : 1;
if [dl == 0 & d. d2 == 0]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       d*m\_rec\_ditf\_array(p\_x+2)(t\_x,-2)+di+d2+1; if (d*lowest)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            int rc = approx_rec_diff(rechray), rechray2, recCmpArray);
score = get_rec_score();
return rc;
                                                                                                                                                                      d = m_rec_diff_array[p,x] (c_x = 11 + 1;
if (d < lowest) lowest = d;
// -- above
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for (ti = 0; (t_char * arr2[ti]) != EOS; ti3+)
                                                                                                                                                                                                                                                                                         d = m_rec_diff_array[p_x - 1][t_x] + 1;
if (d < lowest) lowest = d;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // string indexes
// difference-array indexes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C_x * ti * 1; // Pick the lowest score from the rules // ... upper left
                                                    t_x = ti + 1;
// Plok the lowest score from the rules
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     lowest . d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 m_rec_diff_array(p_x)(t_x) * lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        unsigned char p_char, t_char;
int d, d1, d2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               m_strlen * pi;
m_strlen * ti;
m_rec_ditt * ger_tec_differencel);
return m_tec_ditt;
                                                                                                                                                                                                                                                                                                                                             // .. transposition
if (p) >= 1 && t1 >= 1)
                                                                                                        · upper left
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          int pi, ti;
int p_x, t_x;
int lowest;
```

APPROX.CPP 3-24-98 11:23a

Page 4 of ¢

```
m_diff(...)

If (*p. = 805) // see which is longer, then add the length differential additions charty();

else
                                                                                                                                                           d1 = rec_floot eq(arr1[pi - 1], arr2[r1], diff_matrix) ? 0 : 1; d2 = rec_floot_eq(arr1[pi], arr2[r1 - 1], diff_matrix) ? 0 : 1; if (d1 == 0.0 if d2 == 0.0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // this is only used when the threshold of the original implementation
// is set to 0
const int Opprox:revort_diff(const unsigned that 'strl,
const unsigned that 'strl,
                                                                                                                                                                                                                                                                 d = m_rec_diff_float_array(p_x - 2) (t_x - 2) + d1 + d2 + 1; if (d < lowest)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         const unsigned char 'p; const unsigned char 'p; for the sext, q + stz?; 'p i= EDS if 'q i= EDS, p·, q·+) if (!char_q(!p, 'q))
// -- above diff_float_array(p_x - 1) [t_xl + 1: d - m_rec_diff_float_array(p_x - 1) [t_xl + 1: d - mest + d]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     [out < strl << - < str2 < end < end; 
fout << - ; 
for (ti = 0; ti < m_str2]en; ti <) 
for (ti = 0; ti < m_str2]en; ti <) 
fout << str2[ti] << - ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     m_strl_len * pi;
m_strl_len * ti;
m_rec_float_diff * 9et_rec_float_difference();
recum m_rec_float_diff;
                                                                                                                                                                                                                                                                                                                                                                                                  m_rec_diff_float_array(p_x)(t_x) * lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             m_diff += strlen((const char*)p);
recum m_diff;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ofstream f_out("x.out", ios::appl;
if (!f_out.good())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          byte "Captrox::get_fd_matrix()
                                                                               // -- transposition
if (pi >= 1 && ti >= 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              recurn in [d] matrix[0][0];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 lowest . m_rec_diff_float_array[p_x - 1] [t_x - 1] + rec_float_eq[p_dhar, t_char, diff_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              count float Cipproximes_float_differences(count unsigned char *rechtray),
count unsigned char *rechtray),
count unsigned char recompleting [256] [256].
float accore)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   coust [lost CAptrox:.approx_ref_[lost_diff[coret unsigned clar 'art], coret unsigned char 'art], court unsigned char 'art], court unsigned char 'alt [astrix[356]];361]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             АРРКОХ.ЕРР 3-24-98 11:23а
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for (pi * 0; (p_char * arrifpil) !* 80S; pi**) // 80S is defined as '\0'
                                                                                                                                                                                                                                                                                                                                                              d1 = ter_float_eq/art[[p1 - 1], art2[ti], diff_matrix| ? 0 : 1;
d2 = ter_float_eq/art1[p1], art2[ti - 1], diff_matrix| ? 0 : 1;
it (n1 == 0.0 && d2 == 0.0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tion re approx rec_filmt_diffiredurayl, redurayl, recOmpArray);
scure • get_rec_float_scure();
return ;c;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             \label{eq:def} d = m \ rec \ diff \ [lost\_array/[p,x]] \ (c_x + 1) + 1; if \{d < losest\} \ losest = d,
                                                                                                      \label{eq:controller} d * n_x ec_diff_tloat_array[p_X][t_X \times 1] * 1; if (d \times lowert)_lowert = d,
                                                                                                                                                                                                                                                                                                                                                                                                                                                          d + m_rec_diff_float_array[p_x - 2] [t_x - 2] + d1 + d2 + 1; it (d < lowest)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for (ti = 0; (t_char = arc2(til) != BOS; ti++)
                                                                                                                                                                                                                      d = m_rec_diff_float_erray(p_x - 1| (t_x) + 1;
    if (d < lowest) lowest = d;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // string indexes
// difference-array indexes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  m_rec_diff_float_array[p_x][t_x] = lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       m_strl_len • pi;
m_strl_len • ti;
m_rec_lloat_diff • get_rec_float_difference();
recum m_rec_float_diff;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            t_x = ti + 1;
// Pick the lowest score from the rules
      // Pick the lowest score from the rules // ... upp: left
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         unsigned char p_dbar, t_char, tloat d, dl, d2; int pl, tl; // string indexes int p.x, t.x; // difference-arr, tloat lowest;
                                                                                                                                                                                                                                                                              // .. transposition if (pi >= 1 && ti >= 1)
                                                                                            .. matrikų;
// -- to the left
```

```
APPROX.CPP 3-24-98 11:23a
```

for (t1 \* 0; t1 \* \* m\_att2\understan; t1 \* v) {
 out\_str. Format("1d \* m\_att2\understany(pi) [t1]);
 t\_out \* ... Liverin(out\_mtt);
 }
}
cot \* \* entl;

cont ex entit,

for (pt - 0; pt ex meter, len; pt + ) {

for (pt - 0; pt ex meter, len; pt + ) {

for (pt - 0; pt ex meter, len; pt + ) {

out sit; remetr'len; pt + ) {

out sit; remetr'len; pt + ) {

cut ex length(out sit;);

for ex length(out sit;);

{ out <= erdl; } { out <= erdl; } { out <= erdl; } / out close(); } ferdif

```
char jumbinf(156) - (0);
char indexbuf(156) - (0);
int index(0); // west the acti value of the character from the name as the index into the int index(0); // west the acti value of the character from the group array look up table.

char value: // value from the group array look up table
                                                                                                                                                                                                                                                                                                                                                                                       BEDIN MESSERE FAN (CORMANIZAR). O'ROPETI/PRE)

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Page 1 of 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AfabessageBox("Could not open grouparray,dat file (or reading"); return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              fgets(indexbuf(,5,ga): // get the index
index = atoi(indexbuf(); // convert to an int
value = fgetc(ga): // get the value to put at that index
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if ((ga * fopen("grouparray.dat","r")) ** NJL)
DESCRIPTION DE COP LEN HON BOX, ESP.

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DESCRIPTION DE COP LEN HON BOX, ESP.

THE CONTROL (COP. DE COP. LEN HON BOX, ESP.

HON CONTROL (COP. DE COP. LEN HON BOX, ESP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // narrative paragraph number 2.1.6
// narrative paragraph number 3.2.2
bool ConvVarIdIp::InitGroupArray()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mile(!feof(ga))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            END MESSAGE MAP ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FILE "ga;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DON, COURTED (140). INC., INF., PRINCES, B.D., III, PRINCES, D.D., III, PANA, I.D., III, PANA, I.D., III, PANA, I.D., III, PANA, I.D., III, D.D., III, B.D., I.D., III, B.D., I.D., III, B.D., I.D., III, B.D., I.D., III, B.D., I.D., III, B.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D., I.D.
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CoawMarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp::CoarWarSorp:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Alabasaugebox("Error: A problem occured while constructing the?
*> o code will not work.");
}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          vojd CCanviarScp::fxDataExchange(CbataExchange* pDX)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INPLEMENT_DINCREATE (CCONVALIGED, CPTOPHTYPROGE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     //{ (AFX_DATA_INIT(CConVVar2Grp)
                                                  // Convier Strp cpp : unplementation file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 anidet DEBN;
Auctine new DEBN; Wed
Auchet THIS FILE
static char THIS FILE() * _FILE_;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCONWARZGIP:: CCONWARZGIP()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                //) AFX_DATA_BHIT
m_anto_flag * false;
if (! initGtuspArray(!))
                                                                                                                                                                                                                                                  sinclude "stdutx.h"
Binclude "cdsutil p2.h"
Binclude "ConvVarXdrp.h"
Binclude "defines.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                #include #include cchur.h>
#include cprccess.h>
#include stdlib.h>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             lendif
```

CQ//19ht (C) 1998, Language Analysis Systems Inc.

```
// this function autonates the file nern setting process for the intermediate // files. This is only done in the Uf the rest of the program reads from the // clif toxes to get the needed information.

// this function will not over if the path contains a period that is not in // the final file name. For example if the path is dividobar halffile tot // then the functions produces erroneous results because of the directory and doznawardogn: OcsetPilenames!)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ининининининининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           инининининининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // translate to groups edit boxes
in source (ile for groups box.Setkindo-fext (source);
source - source.Span&chading(**);
butf - source - *gpp*;
in_dest_file_for_groups_box.Setkindo-fext (butf);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // generate the indexes edit boxes
m_gen; indexes, source box. Serviraborbax (buff),
buff = source + :idx*,
m_gen; indexes; idx to Serviraborbax (buff),
buff = Source + :wer;
m_gen; indexes; ive_box. Serviraborbax (buff);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      m_auto_gen_source_file_box.GetWindovText (source);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Browse (im_auto_gen_source_file_box, true, "var");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // dedupe the groups edit bones
in dedupe group; source box.SetMindorText (buff);
buff = source + 'ded.grg';
in dedupe group_dest_box.SetWindorText (buff);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // sort the groups edit boxes m_sort_groups_sourte_box.SetWindovText(buff);
Browse (in gen_indexes_source_box, true, "grp");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     buff * source + "srt.grp";
m sort_groups_dest_box.SetWindovText(buff);
                                                                                                                                                                   Stownse (sin gen_indexes_idx_box, false, "idx");
                                                                                                                                                                                                                                                                           void CConvVar2Grp::OrGenIndexesVecFileBrn2()
                                                                                                                                                                                                                                                                                                                                          Browse (im gen_indexes_vec_box, false, "vec");
                                                                                                        void CConvVar2Grp::OnGenIndexesIdxFileBtn()
                                                                                                                                                                                                                                                                                                                                                                                                                                          void CConvVar2Grp::CnAutcGenScurceBtn()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CString source;
CString buff;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORN EXECUSES | ORN HIERBADGELY,
"Variant files (*.var)|.var|Group files (*.grp)|*.grp|All Files (*.vi|*..||*..
Hall);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Chilebialog f(state, // see the docs on Chilebialog for these parameters
tycus(junktuit(,255,ga); // read any junk thats left, usually comments
                                                                                                                                                                                                                                                                           // whot type of dialog will result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             wold CConvMar3Grp::Browse(CEdic *edit_box, bool state, char *type)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // this selects the destination file for generating groups void CConvVarXcp::OnBrowse4()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // this selects the source file for generating groups
void @GonvVar2Crp::OnBrowsel()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Browse(fm_source_file_for_groups_box, true, "var");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Browse (im_dest_file_for_groups_box, false, "grp");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Browse (sm_dedupe_group_source_box, true, "grp");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Browse (im_dedupe_group_dest_box,false,"grp");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Browse (in_sort_groups_source_bux, true, "grp");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  void CConvVar2Gtp::OnDedupeGroupsDestFileBtn()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Browse(im_sort_groups_dest_box,false,"grp");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        oid CConvVar2Grp::OnSortGroupsSourceFileBtn()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                edit_box-~SetMindowText("");
edit_box-~SetWindowText(f.GetPathNams());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                noid CConvVar2Grp::OnSortGroupsDestFileBtn()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             void (Com/var2Grp::OnDedupeGroupsSourceBtn()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (f.DoModal() -- IDOK)
                                                                                                            folose(ga):
return true,
```

void Convaragin: Ordeninde

m\_group\_array[index] - value; // assign the value

Page 2 of 10

CONVVA-1.CPP 3-24-98 12:17p

```
AtyMegsugeBox("You need to specify a destination file to be sorted");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AfxMessageBox("Could not open the destination file for writing");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \label{eq:local_problem} AkhhescageBox("You need to specify a source file to be sorted"); \\ return; \\
FILE 'dest; // this is only used to create the destination // file so that the getshortpathname() function works (String source,destination;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // #890KT requires short file and path names.
// here is the code that induce this property
// the short path is actually an alias that the OS creates
// if you do a dir // at the compole you can see both the
// long file name and short file name
// then two lines ensure that rpoort gets the aliases
// which conform to the 8.3 found so it can work.
// the rest of the program uses the regular long file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GetShortPartNume(source, short_source, double(256));
GetShortPartNume(destination, short_destination, double(256));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // at position 11
// key 2 (the //:ii) corresponds to the offset which starts
// from position 1 and has a length of 10
// so this command line for the space program sorts by the
// group then by offset within the group
                                                                                                                                                                                                                                                                                                                                                 инининининининининининининининининин
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        инининининининининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Beginkaitchmoort): \frac{d}{dt} = \frac{dt}{dt} = \frac{dt}{dt} which starts t/t are position 11
                                                                                                                                                                                                  int status(0); //the C·· way of doing things I suppose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if ((dest = topen((LPCTSTR))destination,"w")) == NULL)
                                                                                                                                                                                                                                                      m_sort_groups_source_box.GetWindowText(Bource);
m_sort_groups_dest_box.GetWindowText(destination);
                                                                                                       char short_source(256) = {0};
char short_destination(256) = {0};
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (destination. IsBmty())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (source, IsBapty())
```

If (status != 0) // this is for spawn!
//f(status == 0) // this is for cresteprocess
//KossasgeBox("Error sorting the group file").

"/+1:10", (LPCISTR) short\_destination NULL);

EndWaitCursor();

(LPCTSTR) short\_source,

if(m\_auto\_flag \*\* false)
AfxWessageBox("Finished sorting groups.");

return;

// this is the dedupe groups button handler void ConvVar2Grp::OnProcess2()

CString source, destination; bool status;

status - CreateProcess (MEL, // application nows string communities, // commyof line string NGL, // process attributes NGL, // process attributes false, // inheritance handles thay NGMA, // Carticon Carting NGL, // carticon that MIL, // carticon directory name at. // startuck directory name at. // startuck directory name ql); // process informatic

// ok, there is a problem with the way winds and wind!
// hands the createprocess could cookie when it terminates
// I have to figure out what it is
// wind the the span warden of the call is used

nemmer (sai, 0, sizeof (STARTUP DAFO));
si. ch = sizeof (STARTUP DAFO);
si. cheflaga = STARTE USESTOWNEOM;
si. csToowkindow = SM\_STARTE;
//si. csToowkindow = SM\_STARTE;

//PROCESS\_DIFCHPATION pl; STARTUPDEO sl;

char commandiae [156] = [0]: sprint(commandiae, \*tpsort.com /0 %s /\*11 /\*1:10 %s\*, (LPCTSTR) short\_sourca, (LPCTSTR) short\_destination);

Page 3 of 10

CONVVA-1:CPP 3-24-98 12:17p

// do progress bar stuff m\_progress\_bar.SetStep(1); m\_progress\_bar.SetRange(0,100); m\_progress\_bar.SetPos(0);

```
// do the actual translation from IPA name variant to encoded form
// narrative paragraph number 3.2.3
status = Groupify(Asource, Edestination, 6109);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // this little basen of code creates a log file based by the culture of the // file based by the culture of the // file based by the case of the same and sticks the .log management of groups box GerbinkovTextileg);

log a - Log Low?;
                                                                                                                                                                                                                                                                                                                                                                          AtwhissageBux("You need to specify a destination file to be sorted");
                                                                                                                                                                                                                 Af.dhissageBux("You need to specify a source file to be sorted");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // this is the actual function that does the de-duplicating // the 1 enables this to work on groups status + DechyoVariants(Kource, Edestination, 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if(status ... false)
AfxMess.geBox("A problem occured while deduping groups");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // unis button handles calles the function that encodes the varients.
// varients.
// narrative priesfight nameer 1.2.2
void Comentactops:Gocastcopfile()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // get the file names from the interface
a_source_file_for_groups_box.GetWindowText (source);
a_dest_file_for_groups_box.GetWindowText (destination)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AfahissageBox("Finished de-duplicating groups.");
                                  n_denipe_group_source_box.GetWindovText (source);
n_desipe_group_dest_box.GetWindovText (destination);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ALAMinsageBox ("File names must be different", MB_OK | MB_ICOMEXCLAMATION);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AlxAmssageBox("File names must be different", MB_OX | MB_IGAREXCLAMATION);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // do progress bar stuff
m_progress_bar.SetStep(1);
m_progress_bar.SetRange(0,100);
m_progress_bar.SetPos(0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CString source, destination, log;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if(source ** destination).
                                                                                                                                                                                                                                                                                                                   f (destination, IsBapty ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if(source -- destination)
                                                                                                                                            if (course : IsBapty())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return;
```

CONVVA-1.CPP 3-24-98 12:17p

```
// this function converts from variants to groups now called (encoded forms or codes)
// and writes out the unatured groups file
// nature paragraph nature 1.2.2
bool CCOMWarAGEP::Groupffy(GString 'esettiastion, GString '10g)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILE *6, *4; // a is the source file, d is the destination file
FILE *logfile; // this is the error log for weird characters in the groups
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // this is the actual function that cranslates from warlant to encoded form
// via the m_group_array array which contains the group assignments for the
// IPA characters
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // narrative paragraph namer 2.1.6
// narrative paragraph namer 3.2.2
void COm/vardop::ConvertVardop(unsigned char "variant, char "group)
if(status == false)
AforessageBox("A problem occured while convexting to groups");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           •groupStringPtr = m_group_array((unsigned char)*variant);
variant**;
                                                                                 AbovessageBox("Finished converting to groups.");
                                                                                                                                                                                                                                                                                                                                                                                                                                                            unsigned thar *clean_string.ptr * clean_string;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       dirty_string**;
if(*dirty_string (* *clean_string_ptr))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        clean_string_ptr**;
*clean_string_ptr * *dirty_string;
                                                                                                                                                                                                                                                                                                                                                                           if(strien((char *)dirty_string) ** 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 *groupStringPtr * group:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              *clean_string.ptr * *dirty_string;
while(*dirty_string)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        groupStringPtr++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 groupStringPtr '\0';
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           *clean_string_ptr = '\0';
return;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 char "gr
while ("variant)
                                                                                                                                                                              recurn;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return;
```

Page 4 of 10

```
// uncomment this line if you don't want to remove repeating letters 
// don't donget to comment out the previous two lines 
//ConvertVarXoppivariant_buffer, group_buffer); // convert to * group string
                                                                                                                                                                                                                                                                                                           // uncomment these two lines if you want to remove repeating letters for that forget to comment out the following line cleanboaks(wariant, biffer, clean, variant); and convert(arizon) convert(arizon) convert(arizon) convert(arizon) clean, variant, group_buffer); // convert to a group string
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sprint(loc_varians, 147, total_groups);
sprint(loc_groups, 144, total_groups);
sprint(loc_groups, 144, total_groups);
// note: despite their names, these boses no lorger contain the nameer of
// unique variants or groups yet.
// unique variants or groups yet.
// unique variants or groups yet.
// unique groups created box SetWindowText (toc_variants);
// unique groups created box SetWindowText (toc_groups);
// unique groups created box SetWindowText (toc_groups);
// unique groups created box SetWindowText (toc_groups);
// unique groups created box SetWindowText (toc_groups);
// unique groups created box SetWindowText (toc_groups);
// unique groups created box SetWindowText (toc_groups);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // clear out the group buffer, this may not really be necessary forti = 0; i < (MOX_NOWE_SIZE + 1); i++) group_buffer[i] = NUL.;
                                                                                                                                                                                                                                            variant_buffer[strlen[(char *)variant_buffer) - 2] * MLL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // write to the log file
pusitions out "variant_puffer,logfile);
pusitions out ".logfile);
pusitions, puffer,logfile);
pusition, "volgfile);
pusition," logfile);
currer_file_pos = ftell(s);
interval_ctr = currert_file_pos / interval;
if(interval_ctr > prev_interval)
                                                                                                                  m_progress_bar.Stepit();
prev_interval = interval_ctr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (IsGoodGroup(group_buffer))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // put stars in the UI

char toc_variants[20] = {0};

char toc_groups[20] = {0};

char toc_errors[20] = {0};
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // write to file here
total_groups**;
fputs(offset_buffer,d);
fputs(group_buffer,d);
fputc('\n',d);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            while ((fgets(offset_buffer,11,s)) & (fgets((char *)variant_buffer,MAX_MAME_SIZE,s)))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \mathbf{Atom}_{\mathrm{sup}} which for the destinction (ile for writing*); return (alse;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AtahssageBax("Could not open the error lug file for writing"); return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ALAMESSAGEBUX("Could not open source file for reading"); return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // open the files
if {(d = fopen((LPCTSR)*destination, "w"}) -= NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // this stuff is to initialize the progress bar
file_size - _filelength(_fileno(s));
if(file_size)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           it ((logfile = fopen((LPCTSTR)*log,"w")) ** MALL)
                                                                                          if ((s = fopen((LPCISIR) *scapce, *rb*)) -= MUL.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // clear out the buffers
for(i • 0; 1 < (MAX_JAME_SIZE + 1); i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if(file_size > 100.00)
interval = file_size / 100.00;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         interval = 100.00 / file_size;
                                                                                                                                                                                                                                                                                       long int total_variants = 0;
long int total_groups = 0;
unsigned long int current_file_pos;
                                                                                                                                                                                                                                                                                                                                                                                                                 int i: // generic counter
int mm_errors(0): // error counter
boot status = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      variant_buffer[i] • NUL;
clean_variant[i] • NUL;
group_buffer[i] • NUL;
offset_buffer[i] • NUL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       interval . U;
```

total\_variants..;

Debb interval ctr = 0; Debb previnterval = 0; Debb file\_size = 0; Debb interval;

## Page 5 of 10

CONVVA-1.CPP 3-24-98 12:17p

```
AixMessageBux("There is a problem with the source file while reading the variant");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AixMessageBox("There is a problem with the source file while reading the offset");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              length * strien(variant_buff);
variant_buff);
stropy(prev_variant_buff, variant_buff);
nam_variants_read++; // increment the namber of variants read in counter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ALxhessageBox("Could not open source file for reading"); return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if ((d * topen((LPCTSTR)*destination,"wb")) == NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if ((s * fopen((LPCTSTR) *source, *r*)) ** MALL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // read the lst offsor
it((gets/curr_offset_buff, 10 + l.s))
stropy(prev_offset_buff, curr_offset_buff);
else
                                                                                                                                                                                                                                                                       for(i = 0; i < (MAX_NAME_SIZE + 1); i++)</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // this stuff is for the progress bar
file_size = _filelength(_fileno(s));
if(file_size)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // read the 1st variant
if(fgets(variant_buff,MAX_NAME_SIZE,s))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if(file_size > 100)
interval = file_size / 100.00;
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  interval * 100 / tile size;
                                                                                                                                                                                                                                                                                                                                                                                  last_variant(i) = '\0';
variant_buff(i) = '\0';
prev_variant_buff(i) = '\0';
curr_offset_buff[i] = '\0';
prev_offset_buff[i] = '\0';
ints_buffer[i] = '\0';
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else
interval = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                int nm_offeets • 0; // counts the number of offeets per variant
long unsigned int offeet;
set along unsigned int, lessalong unsigned int. • offeets; // used to store a unique pet of offeets
set along unsigned int, lessalong unsigned int. • offeets offeets_iterator; // iterator into the set of of
int set_size;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONVVA_1.CPP 3-24-98 12:17p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // this function is used to deciplicate a sorted file of // group or state records by the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan/Action in the pool Coordan
                                                         // since wo are using 2 as the default for characters that should not occur // in a variant, for example the action force board 2. We can check to see // it the encoded sering is all digits or it it contains invalid spuit.

// it the encoded sering is not all digits or it is contains invalid spuit.

// it the encoded sering is not all digits then something is wrong and its not live viction to the indexes it is logged in the logitie.

In CornwarkTap: ifSoooEroup(cher 'group)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   daw imig_buffer[10 • 1];
daw curg Goffer_buff[10 • 1];
daw prey offer_buff[10 • 1];
char prey over and buff[10 • 1];
char prey vortant putf[10 + 1];
char prey vortant putf[10 + 1];
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c
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILE 'n, 'd; // the source and destination files
DAMPO current, file position '0;
DAMPO interval_ct = 0;
DAMPO PREVIATION '0;
DAMPO file_site + 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      long unsigned int manyariants read * 0;
tong unsigned int manyalque variants * 0;
long double variant_length_accomplator * 0.0;
tong double man_offsets_accomplator * 0.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        int mux_variant_length = 0;
int min_variant_length = 100;
int max_offsets = 0;
int min_offsets = 10000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               int i; // gameric counter int length;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if(:isdigit(*scan))
    return false;
scan**;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       char *scan * group;
while(*scan)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DWORD interval;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            retum true;
```

for(1 = 0; 1: < (20 + 1); i++)

folose(logfile); return status;

Page 6 of 10

```
forite (artice length, sizeof (_int8),1,d);
(pursiprev, wriath_length, bull,d);
(pursiprev, wriath_length,d);
(pursiprev, l, mil tenmente the variant/group to make it e, man_unique_variants+; // increment the unique variants counter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       write_length = strlen(prev_variant_buff) + 1;
variant_length_accumulator += strlen(prev_variant_buff);
                                                                                                                                                                                                                                                                                                        // update the display for groups
ultoo(new_voriantg.read, buffer, 10);
m_nam_groups_read_in_box_SetWindowText (buffer);
strase(buffer, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vdo, \vd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // empty everything
offsets.erase(offsets.begin(), offsets.end());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ultoa (min. variam_length, buffer, 10);
mg.pp. Jen min box. Setkindovfoxt (buffer);
straset (buffer, '\0, 15);
ultoa (mw.foxt. 10);
ultoa (mw.g. offese, buffer, 10);
m.grp. offeses, mw.gox. Setkindovfoxt (buffer);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if ((write_length - 1) > max_variant_length)
max_variant_length = (write_length - 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if ((write_length - 1) < min_variant_length)
min_variant_length = (write_length - 1);</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // write out the number of offsets to follow
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ultos(nam_unique_variants, buffer, 10);
m_unique_groups_box.SetWindowText (buffer);
strnset (buffer, '\0', 15);
                                                                                                       offsets.insert(ato)(curr_offset_buff);
set_size = offsets.size();;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ulcos (max_variant_length, buffer, 10);
m_grp_len_max_box.SetWindowText (buffer);
strmset (buffer, '\0',15);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // write the variant
strcpy(last_variant_buff);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        se_size = offsets.size();
forite(icec, size, sized);
if(sec_size > max_offsets)
max_offsets = sec_size;
if(sec_size < min_offsets)
min_offsets = sec_size;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // close the files and return fclose(s); fclose(d);
                                                                                                                                                                                                                                                                                                                                                                        // write out the last record
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           char buffer[15] • [0];
f(set_size -- 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if(flag == 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        write length = strlen(prev_variant_buft) + 1; // the + 1 is to account for the null we will add later variant_length_accomulator -* strlen(prev_variant_buff);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // write out the list of offsets
for[offsets_iterator * offsets_begin(); offsets_iterator**)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              rorite (worite langth, sizeof [_int8),1,d): // write out the length of the variant puts of it write out the steads variant fputs(1v0, d): // intl it extent wariants (puts(1v0, d): // intl it extents the variants(group to make it easer to read in later anguatque_ariants:: // intrement the unique variants counter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONVVA-1.CPP 3-24-98 12:17p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 size_t check = fwrite(&(*offsets_iterator), sizeof(unsigned long int), l, d);
                                                                                                                                                                                                              while ((fgets (curr_offset_biff, 11, s)) & (fgets (variant_buff, WAX_BWE_S12E, s)))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           non-variants read+: // increment the number of variants read in counter length * strien(variant_buff); variant_buff(length * 1 - NUL_s) | with or in the newline
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if(stromp(prov_variant_buff, variant_buff) -- 0) // variants are the same
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // set the previous buffers to hold the new values offices: carps (prev. yorlant_buff, variant_buff), if empty the list stropy (prev_yorlant_buff, variant_buff); // set prev buffers stropy (prev_orlese_buff, our_offsee_buff); //
                                                                                                                                                                                                                                                                                                                     // progress har stuff
current [list_position - ftell(s);
interval_ctr - current file_position / interval;
if (interval_ctr - prev_interval)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // write out the namer of offsets to follow
set_size = offset3.size();
fwrite(&set_size, sizeof(int),1,0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if ((write_length - 1) > max_variant_length)
max_variant_length = (write_length - 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (write_length - 1) < min_variant_length)
min_variant_length = (write_length - 1);</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      offsets.insert(atol(curr_offset_buff));
num_offsets_accumilator •• num_offsets;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Af:MessageBox("Hold your horses");
      // put the offset in the unique set
offset = atol(prev_offset_buff);
offsets.insert(offset);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      m_progress_bar.Steplt();
prev_interval • interval_ctr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (set size > max_offsets)
max_offsets = set_size;
if(set_size < min_offsets)
min_offsets = set_size;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else // variants are different
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // write out the variant
```

set\_size - offsets.size();

```
sprint(buffer, %, 2f*, (variant_length_accumistor / (double)num_unique_variants));
m_grp_len_avg_low.Seckindorlext(buffer);
strmset(buffer, \(\text{V} \cdot 15);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .f((source ** idxfile) || (source ** offsetfile) || (idxfile ** offsetfile))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AtamessageBox("The files you specified should have different names.");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if(status ** false) AftAressageBox("A problem occured while generating the indexes");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AtxAussageBox("You must specify an Offsets file for output.");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AixhussageBox("You must specify an Index file for output.");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AlahussageBox("You sust specify a source file for input.");
                                                                                                                                                                                                                                                                                                                                                                 // this is the actual index file generation function
status = GenerateIndexes(&bource, &idxfile, &offSetfile);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AtxMessageBox("Finished generating the indexes.");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             //get the file names from the interface
m.gow_indexes source box Cethindroffeet (source);
m.gow_indexes_ich_box.Cethindroffeet (idufile);
m.gow_indexes_voc_box.Cethindovfleet (idufile);
wermer (buffer, '\0'.15);
Ultca|enn offfers, buffer, 10);
migno-offers_min_box_SetWindorfext (buffer);
stringer (buffer, '\0', 15);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CString source, idxfile, offsetfile;
bool status;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         //do progress bar stuft
m_progress_bar.SetStep(1);
m_progress_bar.SetRange(0,100);
m_progress_bar.SetPos(0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                t (offsetfile.IsBmpcy())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         f(idxfile.IsEmpty())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ( (source . IsBrpcy ())
                                                                                                                                                                                                                                                                                     return true;
```

AixMessageBox("Could not open the offsets file for writing"); return false;

if ((ofst = fopen((LPUTSTR) \*offsetfile, "wb")) == NULL)

AlxhessageBox("Could not open source file for reading"); return false;

// this stuff is for the progress bar
file\_size \* \_filelergth(\_filero(src));
if(file\_size)

if(file\_size > 100) interval = file\_size / 100.00;

else interval = 100 / file\_size;

else
interval = 0;
)
while(!feof(src))

if ((src • fopen((LPCTSTR) \*source, 'rb")) -- NULL)

ALMHESSAGEROK ("Could not open the index file for writing"); return false;

// open the files for I/O
if {(idx \* fopen((LPCTSTR)\*idxfile,"\*\*6\*\*)) \*\* NJL)

char group[33] = {0};
int now guaraged line disset\_file\_position[0];
int now offset(0);
unsigned int offset(0);
int i(0); // generic counter used in for loops

// narrative paragraph nurber 1.1.4 bool COrnviar20cp::GenerateIndexes(CString \*source, CString \*idutile, CString \*offsetfile)

FILE \*erc, \*ide. \*ofst;
DOUD current file position \* 0;
DOUD current file position \* 0;
DOUD prev interval \* 0;
DOUD file\_size \* 0;

DMCRC interval, int group\_len(0); Page 8 of 10

CONVVA-1.CPP 3-24-98 12:17p

// This function generates the final index files ".idx and ".vec // narrative paragraph namber 1.2.3  $\,$ 

group\_len • fgetc(src); // read the group length fgets(group,group\_len + 1,src); // read the group

*ининининининининининининининини* 

m\_progress\_bar.StepIt(); prev\_interval = interval\_ctr;

```
AtaMessageBox("A problem occured while converting to groups.\nThe rest of the steps were not performed.");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ArchessageBox("You need to specify a source file to be sorted.\nThis step was not performed successfully."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         At whe sage Box (*File names must be different.) offinis step was not performed successfully. The Health STAN MATCH is a second that the second successfully. The second successfully is the second successfully.
m_auto_flag + true; // set this so that some of the AbbhessageBones do not display
                                                                                                    if(source.IsBmpty()) // shkwldn't happen but its here anyway
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ининининининининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // get the file names from the interface
m_source_file_for_groups_box.GetWindowText(source):
m_dest_file_for_groups_box.GetWindowText(destination);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // get file names from the UI
m_dedupe_group_source_box.GetHindorText(source);
m_dedupe_group_dest_box.GetHindorText(destination);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           m source_file_for_groups_box.GetWinkorText (log);
log = log.SpanExcluding(".");
log ** "_log.txt";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        status - Groupify(ksource, Adestination, Alog);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // do progress bar stuff
m_progress bar.SetStep(1);
m_progress_bar.SetRange(0,100);
m_progress_bar.SetPos(0);
                                                                                                                                                                                                                                                              // do progress bar stuff
m_progress_bar.SetStep(1);
m_progress_bar.SetRange(0,100);
m_progress_bar.SetPos(0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (source -- destination)
                                                                                                                                                                 // Generate groups step
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (status -- false)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              UpdateWindow();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JudiceWindow();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 Se
                                              freadlusm offsets asset first). I set ). Wend the number of offsets to follow cited for the first first of the first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first first fir
                                                                                                                                                                                                                      .. o index file
farite(simm_offsets,sized(unsigned int),1,idx); // write the number of offsets to follow
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              treadinoffset, sizeof (unsigned int), 1, src); // read an offset frequencial for the offsets tile fortisets, sizeof (unsigned int), 1, ofst); // write the offsets to the offsets file
                                                                                                                                                                                                                                                                                                                                                            tur(1 + 0; i < num_offsets; i++) // loop for as many offsets as there are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // this function is used to automate the entire process for one culture. 
 // it is supposed to be called when all the filterames have been specified void CDon/4x3CPp::GDDA13kepcf)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // this function is used to get rid of the intermediate files that
// are protected aurny for database to blidding phase.
// these files are the *.gpp. *.vor files
boal ComywarXDpp.toleteintermediateFiles!)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return (status ** 0); // this works around the old bool problem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            status - remove(fileinfo.name);
while(_findnext(handle, &fileinfo) !* -1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      status * remove(fileinfo.name);
while(_findnext(handle, ffileinfo) (* -1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           //delete the .var files
hardle = _findfirst(filespec, filleinfo);
if(hardle !* -1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // remove the '.grp tiles
sprint((filespec, ".grp"):
handle = _findfirst((filespec, &fileinfo);
if(handle != '1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                status - remove(fileinfo.name);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       status • rumove(fileinfo.name);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    fclose(ist);
fclose(idx);
fclose(ofst);
return true;
```

bool status; CString source,destination,log; CString iddile,offsetfile;

> fpic(group.ids): // write the group to the index file for(i \* strien(group): i < MAX\_NAWE\_SIZE \* 1; i.\*) // write padding fpuc('\0',ids);

Page 9 of 10

CONVVA-1.CPP :3-24-98 12:17p

```
mag s. N problem occured while deleting the intermediate files.\n^*;
mag s. *!ou should delete them namaally. Delete all the files with the .grp and .var extensions.';
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ostring mag;
mag = "Marning: This operation will delete all the intermediate files\n";
mag == "too should only clear out the intermediate files when you have performed all the\n";
mag == "steps for generating the index files for all the outures.\n";
mag == "toy you want to delete the intermediate files now ?";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Aconssageflox("All steps were performed successfully.\nProcessing is complete.");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AboMessageBox("The intermediate files were deleted successfully.");
                                                                                                                                                                              AintessageBox("A problem occurred while generating the indexes");
                                                                                                                                                                                                                                                                                                                                   stacus » GenerateIndeces (secure, sidefile, Soffsetfile);
aphrewindow();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (AfahessageBox (msg, MB_YESND) ** IDYES)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if(DeleteIntermediateFiles() -- true)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     wold CCmv/arZGrp::OnClearTempFilesBtn()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ALANessageBox (msg);
                                                                                                                                                                                                                                                                                                                                                                                                 m_auto_flag = false;
UpdateWindow();
                                                                                                                if (status -- false)
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                                                                                ALGRESSOPHICA("You need to specify a destination file to be sorted.\nThis step was not perforted successfure terum;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              f((source ** idafile) || (source ** offsetfile) || (idafile ** offsetfile) // skouldn't happen but its her
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AtamessageBox("You must specify an Offsets file for output.\nThis step was not performed successfully.");
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the steps were not performed.");
                                                                                                                                                                                                                                                                                                                                                                                                 Attehnishing the names must be different. Virilia step was not performed successfully. , where we get in the located AMTION;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AfAMmssageBox ("A problem occured while deduping groups.\nThe rest of
                                                                                                                                                                                                                                                                                                                                            if(source -- destination) // shouldn't happen but its here anyway
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // the 1 enables this to work on groups status - DetupeVariants(Asource, Edestination, 1); UpchsteWindow();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         //get the file names from the interface
in gap intelest carred box (cettinaborbat learnes);
in gap intelest jut box (cettinaborbat (idatile);
ings) intelest jut box (cettinaborbat (idatile);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   //do progress bar stuff
m_progress_bar.SetStep(1);
m_progress_bar.SetRange(0,100);
m_progress_bar.SetRas(0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          it (status .. false)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return;
```

Page 10 of 10

CONVVA-1.CPP 3-24-98 12:17p

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// initialise all these pointers to MIL, so we can detect errors later on imputames = MIL;
processing = MIL;
anglobur = MIL;
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anglobur = MIL;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                         //OdmamedbDg::OdmamedbDg(Omd* pParent /*-NUL*/)
// : Obialog(OdmamedbDg::IDO, pParent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    void Offeramedible::DobataExchange(ChataExchange* pDX)
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hispanickot • Null;
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chinesekuleste • Null;
chinesekuleste • Null;
myka • Null;
brackt • Null;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // ClassWilsard generated virtual function overrides
// ClassWilsul(Oboutly)
protected:
virtual void COOLtaExchange(ChataExchanger pIX); // DIX/DDV support
/// NAY_VIRTUAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    void ObboutDig::DoDataExchange (CDataExchange* pDX)
{
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                                        Aitdef _DEBUS HEM MAETINE NACTION OF DEBUS_HEM MADER THIS_FILE static char THIS_FILE!! * _FILE_; FORTAIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // make the linker happy with tdslib:
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//{{AFX_DATA(CaboueDig)
enum { IDO • IDO_ABOUTBOX };
//{}AFX_DATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   //{{AFX_DATA_INIT(CN:outDlg)
//}}AFX_DATA_INIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       class Cabouthly : public Chialog
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         soundDistance;
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DECLARE_MESSAGE_MAP()
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                                                                                                                                                                                                                                                                                                                                       finclude <io h
             linclude "stdafx.h"
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Chistance
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Objetog::DobeteBuchange (p0X)
//{{Asx\_Data\_HeP(CaboutD)g}
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Capyright (C) 1998, Language Analysis Systems Inc.

// minamabbly opp implementation file

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void OMcnamedDOlg::OnSysCommand(UINT nID, LENRAM lPacam)
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pSystem.-Appenditem(MF_STRIR5, IDM_ABOUTBOX, strAboutMem);
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or di Settocci (Inc., Valo, Buris, Colectocca-deribali eles)
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ASSERT(IIM_ABOUTBOX & OAFFO) -= IDM_ABOUTBOX);
ASSERT(IIM_ABOUTBOX < OAF000);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CString strAboutMenu;
strAboutMenu.LoadString(IDS_ABOUTBOX);
if (!strAboutMenu.IsDnpty())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Add "About..." menu item to system menu
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if (PSysheru := MULL)
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nas.:86\_GUNESS. 'sgames.dbf.'sgati.dbf., 'sgati.dbf.,' 'csames.dbf.'sdati.dbf.'sgati.dbf.' nas.:86\_KISPNIC. 'sgames.dbf.' 'sgat.dbf.', 'sgati.dbf.' 'nasmes.dbf.' 'stati.dbf.', 'shatri.dbf.', 'nasmes.dbf.' 'stati.dbf.', 'shatri.dbf.',

// initialize the file dialog focus to the anglo rules, along with its type active blo - arc anglo rules; active blo - RLL;

// Set the ion-for this dialog. The framework does this automotically // when the application's main window is not a dialog settoming. Micro TRES); // Set big ion Settoming. Micro TRES); // Set has it ion

// initialize the mas object so we can classify names are nasinas; "mydas o ime nasinas; "mydas o ime nasinas; "de", "sadi.dd", "satil.dd"

mmg-Pormat( "Error initializing NAS Name Classification facility." ); m\_log-AddString( mmg );

CString msg: if ( mytas->get\_status() :• 0 )

// set file name defaults
mc\_processing.txt" );
mc\_processing.txt" = setvindorext("processing.txt");
mc\_hispanic\_variants.Setvindorext("hisp.nam");
mc\_hispanic\_names.SetvindorPext("hisp.nam");

mc\_chinese\_variants.SetWindowText( "chin.var" );

mc\_chinese\_names.SetWindowText( "chin.nam" ) mc\_arabic\_names.SetWindowText( "arab.nam" ); mc\_anglo\_variants.SetWindowText( "angl.var" mc\_anglo\_names.SetWindowText( "angl.nam"); 

MKNAME\_1:CPP 3-24-98 12:17p

Chialog::OnSysCommand(nID, 1Param);

return FALSE; // return TRUE unless you set the focus to a control

if ((nID & OXFFFU) ... IDM\_ABOURDOX)

OboutBlg digAbout; digAbout.DoModal();

homeDir . getowd( NULL, MAX\_PATH );

mc\_hispanic\_rules.SetWindowText("hisp.rul"); mc\_simplified\_rules.SetWindowText("tds.simp\_rul");

// set the input focus to the input names file edit box activeElle en financiames; activeElleType = TGT | mc\_irput\_names.SetTochs();

```
// The pystem calls this to obtain the cursor to display while the user drags
// the minimized window.
HCRSOR OMcommcEDig::OnQueryOtagloom!)
// If you add a annisize button to your dialog, you will need the code below // to draw the icon. For MPC applications waing the document/view model, // this is automatically done for you by the framework.
                                                                                                                                                                                                                                                                                                                           Sendhessage (Mr_ICONERASEBICAD, (WPARAM) dc.CetSafeHdc(), 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // narrative paragraph number 3.1.
// narrative paragraph number 3.1.
// check the name (passed as 'imput') for errors in length or content
// check the name (passed as 'imput') for errors in length or content
// is it is not a deplicate
int Cleantherne ( dar 'imput )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      )
if( result ** NO_ESROR & stromp( input, previous ) ... 0 )
result * DUP_ESROR;
                                                                                                                                                                                                                                                                    ChainLDC dc(this); // device context for painting
                                                                                                                                                                                                                                                                                                                                                                                     // Center from in client rectangle in colon - des/stemberics (8_CXXXXI); in cylon - des/systemberics (8_CXXXII); in cylon - des/systemberics (8_CXXIXII); Gett rect; etchick) - colon - 1) / 2; int y - (rect. Melght () - cylon - 1) / 2; int y - (rect. Melght () - cylon - 1) / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if( len < MIN_LDN ) result = MIN_ERROR;
else if ( len > MOX_LDN ) result = MOX_ERROR;
else while( 'P != NULL )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           {( ''/' =' q* ) 44 ( q* )add[si: )}if
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              result - CHAR_ERROR;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // Draw the icon
dc.DrawIcon(x, y, m_hIcon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else strcpy( prevName, imput );
return result;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     len = strlen( uput );
prevName [MAX_LEN];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDialog::OnPaint();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           result . NO_ERROR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return (HCURSOR) m_hlcon;
                                                                                                                                        void Officemedialge::OnPaint()
                                                                                                                                                                                                          if (Isloonic())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .p * input;
```

MKNAME 1.CPP 3-24-98 12:17p

```
if( !isdigit( *p ) as (!salpha( *p ) as *p !- *2' }) result - CAAR_ENGOR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // Open all the files needed for processing, using the OpenPile utility.
// Decoution stops upon the first error, if any.
800L OMNumenbOlg::Initialize[OFilest]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // Open a file as named in foame, into the object pointed to by "file // use the flags as the open mode. Report errors if any.

BOOL OwnsmethOlg::OpenFile( FILE "file, CString frame, char "flags)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         mag.Format ( "EXMOR: there is a NALL file name." );
m.log.Addstring (mag );
If( precessing ) fprint(| processing, "ta\n", mag );
result = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               mag.Format('Error opening file la', frame);
m.log.Adducting(mag);
if( processing) (print((processing, 'la\u', mag));
reali. * false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                openFile (anglottot, a anglo_variants, "" ) ist
openFile (anthictot, a rathic terms, "" ) ist
openFile (arthictot, a rathic voriants, "" ) ist
openFile (chinesettot, a chinese rames, "d" ) ist
openFile (chinesettot, a chinese rames, "d" ) ist
openFile (chinesettot, a chinese rames, "d" ) openFile (chinesettot, a chinese rames, "d") openFile (shispanictott, a hispanic rames, "d")
openFile (shispanictott, a hispanic rames, "d")
                                                                                                                                                                                                                                                                                                                               p++;

for( i = 0; i < 5; 1++ )

if( !iedigit( 'p )) result - GRA_ENGOC;

else p++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else if(( *file * fopen( fname, flags )) ** NULL )
// check that the groupD value passed in is valid in form
int ClearGroupD( char 'groupD )
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if( bomeDir ) _chdir( bomeDir );
if( fname.leDmpty())
{
                                                                                                                                            result . NO_SWOOR, 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else result . false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CString msg:
BOOL result = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      return result;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BOOL result = true;
CString msg;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return result;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return result;
```

age 5 of 12

```
// narrative paragraph narber 13.1.5 through
// narrative paragraph narber 13.1.
// narrative paragraph narber 13.1.
ring Obsensibilia::Processibiliants: CErting input, CErting vinput, char 'groupiD, unsigned long id, RuleSet 'r 's MicSet.'
                                                                                                                 // line numbers were errorsous and irralewant. Took them out.

case MILE EDBAR and From (* 1920R): "He is too Sont.", input); break;

case GOAR_EDBAR: mag Frommat(* 1920R): "He is too long.", input); break;

case GOAR_EDBAR: mag Frommat(* 1920R): "He is a donline name; input); break;

case GOAR_EDBAR: mag Frommat(* 1920R): "He is a donline name.", input); break;

case BASTA_EDBAR: mag Frommat(* 1920R): Bad repea for "He", input); break;

case BASTA_EDBAR: mag Frommat(* 1920R): Bad repea for "He", input); break;

case BASM: DRARE: mag Frommat(* 1920R): Bad repea character between group number and name (or 'He').
                                                                                                                                                                                                                                                                                                                                                                                                 -> ..imput); break: // ara
case FILE_DHT_BRAR: mag.Format(*DROR: The file 'is' had problems.", imput); break: // ara
case HerJ_OFP_EROR: mag.format(*DROR: The imput file 'is' could not be opened.", imput); br
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              unsigned lang "offset, FILE "nout, FILE "vo
//case REEX_ERROR: meg.Format("ERROR: Bad regex for '%s' (line %d)", input,lineNum); break; // arm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "nariants;
oftendam; // sun the info records, to add to the offeet
i, k., len, numfariants, numBES;
last(C - 0, sinCobeArray[00x_LD];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             m_log.AddString( meg );
m_log.AddString( meg );
m_log.AddString(meg );
m_log.AddString(meg );
fprint(| processiog. 'ls\n', meg );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // Once a name has been determined to be valid, and it has been classified,
// this method is called to generate and upcress its availants.
// while serbod is called to generate and upcress its availants.
// happ ovariants, and once for generating be cultume-specific variants.
// The nulses, itiles, and once to generating the cultume-specific variants.
// The nulses, itiles, and once parameters relevant to processing and recording.
// The nulses, itiles, and once parameters relevant to processing and recording.
// Imput' is the new itself, and vinque; is the name padded with an initial
// time seconpasse all of 1.1.5 through perhaps 3.2.3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // INC. WARDS CODE BAD 19552. Traper generated for expitied) was invalid
// INC. WARDS CODE, TOO BANY without serts generated
// at this point only the first too have any enaming because the conditions that
// generate the third one have not been implemented yet.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // the geneariants() function was changed to return a code by reference \ensuremath{//} the code takes 3 values right now
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // all im going to use the codes for is to put out a message informing // of the condition.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    variants = ruleSet->genVariants( vinput, FALSE, TRUE, 0, code);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             regex_meg.Fourmat("%s using the %s ", virput, rulesetname);
ReportError(5, regex_meg, line);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TICS VARGEN CODE OR
TICS VARGEN CODE BAO REGEX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .. ut, CString rulesetname, int line )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (code == TDS_VARGEN_CODE_BAD_REGEX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               reyex_msg;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tds_vargen_code code;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              vector<CString>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           unsigned char
CString
CString re
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -> eak; // ara
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            //case HIM_DROOK, meg.Format( "EDROR: 'Ne' ip too short. (Line Hd)', imput, lineNum ); break; //case FAX_DROR: meg.Format( "EDROR: 'Ne' is too loop (Line Nd)', imput, lineNum ); break; //case GAR_GROR: meg.Format( "EDROR: 'Ne' contains illogal characters (Line Nd)', imput, lin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        //case DUP_ERROR: msg.Format( "EDROR: 'ts' is a duplicate name (line Vd)", input, lineNum ); b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // This function is a MANK ARCARD for the variants that have stray ASCII 5 characters // in them. Most are due to the fisither! coming from (mostly word-final) H // This function is 10 LOGGR called, but is kept here in case a similar // problem should occur in the future.
         // narrative paragraph narber 1.1.7
// For all the variants paragraph for the foreign of initial characters
// For all the variants paragraphs for all, or none of the variants begin with vowels
narrative fixed variants // variants //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if( IS_VOWEL(( *variants ) [1] [0] )) scmeV * true;
else someC * true;
if( scmeV & scmeC )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // A utility to simply report an error of various kinds.
// the lineum is passed in but its no larger used
void OMozamedbolg::ReportError! Int error, CString input, int lineNum )

 k, len • variant-»GetLength();

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for( k = i+1; k < len; k++ ) p[i] = p[k];
                                                                                                                                                                                                                                                                                                                                                                                                                     if ((( *variants )[i] ) GotLength() > 0 ) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     p * (unsigned char *) variant-x2etBuffer( len );
for( i = 0; i < len; i**)</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if( sameV & :sameC ) status * OfLY_V;
else if( sameC & :sameV ) status * OfLY_C;
return status;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           status * BOTH_CV;
break;
                                                                                                                                                                                                          i, size = variants->size();
scneV = false, scneC = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // narrative paragraph number 1.1
// narrative paragraph number 1.1.1
void StripASCIFive( CString 'variant )
                                                                                                                                                                                                                                                                                                                                                                    for( i = 0; i < size; i++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            len--;
p(lent = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     variant->ReleaseBuffer();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if( p(1) -- 5 )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              switch ( error )
                                                                                                                                                                                                                                                                                                   status . Of LY C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              څ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .> ethm 1; break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         unsigned char
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CString meg;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    e, reak;
                                                                                                                                                                                                                    int
BOOL
Char
```

Page 4 of 12

MKNAME 1.CPP 3-24-98 12:17p

```
unsigned long anglooffset = 0, arabiooffset = 0, chinescoffset = 0, hispanicoffset = 0; // offsets into the 
--: and filted and filted the set of the set of the set of the set of the set of these can be immalidually and only to 0, // total number of valid names read in from the input file.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Citring rulesetname; // weed to pass the name of the rule set to the processwariants() function so that 
// we can tell which rule set was being used then the regersp error occurred. 
// this was the easiest way to do it.
                                                                                                                                                       int maxChineseV st 0; // greatest number of variants generated by one chinese maintenantsV st 0; // greatest number of variants generated by one hispanic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // these are used to keep track of which name produced the most variants :-)
String most_prolific_arabi
String most_prolific_arabi
String most_prolific_arabi
String most_prolific_arabi
nawi; // narter of variants generated by the ProcessVariants() function makes, 0.0 // greatest narber of variants generated by one angle of extendity' 0.0 // greatest narber of variants generated by one angle of makes of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // these four variables will feep track of the total number of variants unsigned long total_anglo_variants(0); unsigned long total_trab_variants(0); unsigned long total_trab_variants(0); unsigned long total_tribuses_variants(0); unsigned long total_tribuses_variants(0);
                                                                                                                                                                                                                                                                                                                     unsigned long nhumbic = 0; // number of names classified as acabic unsigned long orbinese = 0; // number of names classified as chinese unsigned long milipanic = 0; // number of names classified as hispanic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ининининининининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       meg.Format ("Processing (ile 1s...", m_imput_names );
m_log.AddString(mag);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            //an enumerated type, that records the result of // the classification done by mas enum mas::language lang;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             mcg.Format("Finished sorting the names file");
m_log.AddString(mcg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // this stuff is for the progress bar
DACNO interval_ctr = 0;
DACNO prev_interval = 0;
DACNO file_size = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meg.Pormat("Sorting the names file");
m_log.AddString(meg);
UpdateWindow();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DWORD interval;
unsigned long int current_file_pos;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  UpdateWindow();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SortNames();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // ara code
                                                                                                                                                                                                                                                                                   (pars) input, rout ); force ((0,1)) force ((0,1)) rout ); oftenodership is size of unsigned long ) + serien (input ) + 8; // length of id, group (D), name, and on oftenodership is size of unsigned long ) + serien (input ) + 8; // length of id, group (D), name, and on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       char input (MA_Di_ER), vinput (MA_IN_ER), group (D)); // input buffers for the input names and ORO group or id strings (String meg; // genetic buffer used for vriving name; // genetic buffer used for vriving name; //
numbarants - variants-size():
numbar s variants-size():
numbar - variants-size():
// write our the record to the names file
fortied id, size() unsigned long ), nout );
fortied id, size() unsigned long ), nout );
fortie( groupD, size() unsigned clar ), 7, nout );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // narrotive paragraph narbor 3.1
// this intented goes throught the name input file line by line, validates each name,
// this intented goes throught the name and its variants into the james and variants files.
// classifies it and processes the name and its variants into the james and variants files.
// scatistics are gothered and reported regarding variant numbers // lassification,
// and rocal input and valid names
// and rocal input and valid names
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // NOTE: the next two lines must be commented in or out together, as
// the length must be recalculated iff the Strip routing is called:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // output the leading consonants to the names file if (unsigned char) (( 'variants) [[][[]]) := lastIC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mcg. Pormat ( "ESROR: MULL variants generated for 'Ns'", imput );
m_log.AddString( mcg );
fprint{( processiog, "Ns\n", mcg );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        lastIC = (unsigned char ) (( *variants ) (i) [k]);
furite( &lastIC, sizeof( unsigned char ), 1, nout );
offsetAddenthm++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           }
// output the variant and offset to the variants file
tprint( vout, "110.10dts\n", "offset, ("variants) (i) );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (// upsice the offset based on the total site of the record just written
offset -> offsetAddenthm;
offset -> offsetEddenthm;
return nawaishits;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               formite( samedodekray, sizeof( unsigned char ), numBEEs + 1, nout ); offsetAddentam \cdots numBEs + 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            //StripASCIIFive( &((*variants)(i)));
//len = (( *variants ) {i} ).GetLength();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          k = 0;
len = (! *variants ) (i) ).GetLength();
if( len > 0 )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                fpuc( GetVomelStatus( variants ), nout );
offsetAddendam**;
for( i * 0; i < namWariants; i**)</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  )
fputc( '\0', nout );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ., e zero
```

Page 5 of 12

MKNAME-1.CPP 3-24-98 12:17p

```
// here is where the variants are generated
// new/is the inner of variants produced
// new/is the inner of variants produced
// this is done to all records by default
// this in processes for the anisy rule set, this is done to all records by default
                                                                                                                                                                                                                                                                                                                                                                                                         larg = \pi_i v_i u_i a_i a_i a_j v_i e_i (input: 7); virput: 0) = ': '// name must be space delimited for variant generation virput: 0) = '\( v_i \)/.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       rulesetnam = "chinese rules";
nam' = Processvariants( input.?, virput, groupID, valid, chineseRuleSet,
&chineseOffset, chinesePout, chineseVout, rulesetnams, tocal + 1 );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         rulesetname = "arabic nules";
numV = ProcessVariants( input-7, virput, groupID, valid, arabic@uleSet,
tarabicOffset, arabicOtte, arabicOtte, nulesetname, total + 1 );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          rulesciname = "anglo rules";
nand = ProcessVariants( input.); vinput, groupID, valid, anglobuleSet,
eangloOffset, angloNout, angloNout, rulesciname, total = 1 );
                                                                                                                                                                                                                                                                                                                                                                          //this line determines what culture a name is classified as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // if a name is classified as arabic this stuff is done
// Chinese and Hispanic counterparts follow as options
if( lang ** nas::NGS_ARABIC )
                                        // imput-7 is where the name starts tids_strip(imput-7); stript(imput-7); if((artor - ClearWare(imput-7)) := ND_SERCR)
                                                                                                                                                                                                                             ReportError ( error, input+7, total+1 );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else if ( lang -- nas::NAS_CHINESE )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            total chinese variants +* numV;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                maxAnglov • numV;
most_prolific_anglo • virput;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              maxArabicV • rumV;
most_prolific_arab • vinput;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              total arab variants .. numV;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               total_anglo_variants .. numV;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      streat(virgut, input-7);
streat(virgut, ' );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if ( num > maxChineseV )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if ( rumV > maxArabicV )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if ( numV > maxAngloV )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nArabic.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            stingly(groupID, input, 6); // the group id is just a 6 digit id that ORD uses to group names
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tocal**; // this counts the total number of names read in, the names can be invalid // so total may not necessarily equal the number of valid records read in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // progress but studd:
// progress but studd:
// grince to the file size and calculates the interval that is 1/100 th of the file size
// sizes I set the range of the progress bar to be 100 units long.
file_gize - file!engible_file.onlingacklames!);
file_gize = file!engible_file.onlingacklames!);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // the inputkares file is opened with the initializatOFiles() function before the // ProcessFile() function is called. this is done in the GrOK() function. // at this point all the files should be open.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // make sure there is a space between the groupID and the name if (input(6) [** ' ')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ининінийнининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // progress bar stuff
// this is what controls the advance of the progress bar current_tile_pos of tell linputkAmes);
interval_ctr = oursent_tile_pos / interval;
if(interval_ctr > prev_interval)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Report Error (INPAT_OPEN_ERROR, (LPCTSTR)m_input_names, 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // get the names
wnile( fgets( input, MAZ_IN_LED), inputRames ) != NJL )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            groupID(6) = 0;
if((error = ClearSroupID(groupID)) != NO_ERROR)
// close the old input file and point to the new sorted
// input file for processing.
                                                                                                                                                                                     mc_input_names.CetWindovText(m_input_names);
BOOL ok + OpenFile(&inputMames, m_input_names, "t");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    else
interval = 100.00 / file_size;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if(file_size > 100.00)
interval = file_size / 100.00;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     m_db_progress_bar.StepIt();
prev_interval • interval_ctr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ReportError (6, input. 0);
                                                                                     Iclose (inputilemes);
inputilemes - MIL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else
interval = 0;
                                                                                                                                                                                                                                                                      if (!ok)
```

ReportBrow( error, groupID, total+1 );

UpdateWindow();
tprintf( processiog, "Ns\n", meg );

Page 6 of 12

MKNAME 1. CPP 3-24-98 12:17p

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// Any errors are reported.
BOOL O-WomanedDODg::InitializeRuleSet( RuleSet **ruleSet, CString frame, Fil& *fp )
                                                                                                                                                                                                                                                                                                        m_log.SetTopIndex(m_log.GetCount() - 1); // scroll down to the end of the list
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // This method initializes a nulescy pointed to by "rutleder, which is contained."

if in the filte farmer, to points to the previously opered simplified rules file.

// This is added to the nule set if it is initialized property.
                                                                                                                                         reg. Perest ("14 Hispanic variants were produced", cotal hispanic_variants);
in log. Modicinjd (reg.) ;
fp.nitt (processing, "1911", reg.);
mog.Pommat("Nd Chinese variants were produced".total_chinese_variants);
m_log.AddString( mog );
fprintf( processiog. "Ns\n", mog );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // at this point the sorted file is deleted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        handle = _findfirst((LPCTSTR)m_input_names, &fileinfo);
if(handle != -1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // get rid of the sorted input file here
long handle;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // get rid of daugling pointers input/lems - Will.; procession - Will.; angloton - Will.; angloton - Will.; arabicton - Will.; arabicton - Will.; arabicton - Will.; dineston - Will.; dineston - Will.; hispanicton - Will.; hispanicton - Will.; hispanicton - Will.; hispanicton - Will.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 status = remove(fileinfo.name);
                                                                                                                                                                                                                                                                                                                                                                       // close all files (close imputheres); felose (imputheres); felose (close (anglobur ); felose (arabichbur ); felose (arabichbur ); felose (arabichbur );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     fclose( chinesethut );
fclose( chinesethut );
fclose( hispanichut );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     fclose(hispanicVOut);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              finddata_t fileinfo;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CString temp_str;
BOOL result • true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            int status (0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mag.Formuct '14 was the maximum number of Hispanic variants produced by Nor, mouthspanick, most_prolitic_his ** panel in Ack AddString (mag.);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mog.Format ("ld was the maximum number of Chinese variants produced by %s", maxChineseV, most_prolific_chine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  may format ("14 was the maximum namber of Awylo variance produced by 1s", maskayloV, mast_prolitic_anglo); m_164_AWASI:rist[med]

[m_164_AWASI:rist[med]

[formit[processlog], "4tM", may ];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        may Formack '1d was the maximum number of Arabic variants produced by 16° maxatrabic's, most_prolific_atab):
m_log-Addering| max
[Formitt] processiog, '1s\n', meg ];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // print out statistics
promote Tone, Retained 1d valid records out of 1d records processed.*, valid, total );
m_log_AMErrolg (mg );
fprint( processLog, "to\n", mg );
                                                                           nulesercare - "hispanic rules"; rank - Process'ariants ( input-\theta, vingut, group D, valid, hispanicRuleSet shispanicOffeet, hispanicVott, nulesername, total + 1 );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MKNAME_1_CPP 3-24-98 12:17p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mcg.Format( "1d Anglo variants were produced" total anglo variants);
m_log.AxtString( mcg );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ncg. Formut ( "1d numes were çlassitied as Hispanic.", rMispanic ):
m_log.AddString( mog );
{print(| processiog, "lu\n", mog );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       reg.fonmit( 'td names were classified as Chinese.', nChinese );
m_log.AAMString( meg );
tprintf( processiog, 'ts\n', meg );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  msg.Format( "Nd names were classified as Arabic.", nArabic );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      valid..; // this counts the number of valid records
            else if ( lang -- nas::NAS_HISPANIC )
                                                                                                                                                                                                                                                                                                                                                  mardispanicV = numV;
mst_prolific_hispanic = vinput;
                                                                                                                                                                                                                total hispanic variants +* namV.
                                                                                                                                                                                                                                                                                   it ( namV > maxitispanicV )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   n_log.AddString( msg );
fprintf( processiog, "fs\n", msg );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                n log.AddString( msg );
tprintf( processiog, "1s\n", msg );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -- panic);
m_log.AddString( msg );
tprint({ processiog, "ts\n", msg );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        riti spanic++;
```

meg. Format ( '1d Arab variants were produced', total\_arab\_variants); m\_log.AddString( meg ); {printt( processiog, '1e\n', meg );

fprintf( processing, "ta\n", mag );

maxchinesev = numv; most\_prolific\_chinese = vdrput;

nChinese\*\*;

```
static char "filletypast" | - (
"Bate Fillet ("Anal All Files ("Anal)" ("Anal All Files ("Anal)" ("I)",
"Those Files ("Anal I Anal All Files ("Anal I") ("I)",
"Here Files ("Anal I") Anal All Files ("Anal I") ("I)",
"Variant Files ("Anal I") ("Anal I") ("Anal I") ("I)",
"Day Files ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Anal I") ("Ana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // A file brows request has been made, which invokes this method.
// an active file Chait object and its type have been previously set,
// and the dialog configures itself, and affects the right objects, accordingly.
void Optomobibly; obstrose()
                                                                                                                                                                                                                                                                                                                                              // This method initiates the entire process based on user hitting the button.

// All title names are grabbed from the interface.

// The progress has set up.

// 1/0 titles are initialized.

// Rules Sets are initialized.

// The mores input title is processed.

void ObtamentDig::OCX()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mc_hispanic_variants.GetbindonPast [ m_hispanic_variants);
mt_hispanic_names.GetbindonPast ( m_hispanic_variants);
mt_hispanic_names.GetbindonPast ( m_hispanic_names);
mt_chinese_variants.GetbindonPast ( m_chinese_variants);
mt_chinese_names.GetbindonPast ( m_arabic_hames);
mt_arabic_names.GetbindonPast ( m_arabic_hames);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mc_input_panes (activino-fract ( a_input_panes) ;
mc_input_panes (activino-fract ( a_input_panes) ;
mc_indise_ands (activino-fract ( a_insigo_nutes) ;
mc_ininese_nutes (activino-fract ( a_input_panese_nutes) ;
mc_ininese_nutes (activino-fract ( a_integral(c_inles) ;
mc_input_c_nutes (activino-fract ( a_integral(c_inles) );
mc_input_t(a_inutes (activino-fract ( a_integral(c_inles) );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // TODO: Add your control notification handler code here
if( activeFile )
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   и
попативания принадательной принадательной принадательной принадательной принадательной принадательной принада
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mc_anglo_names.GetWindowText { m_anglo_names};
mc_arabic_variants.GetWindowText { m_arabic_variants};
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         m_log.ResetContent();
if( InitializeRules()) if InitializeRules())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    m_db_progress_bar.SetStep(1);
m_db_progress_bar.SetRange(0,100);
m_db_progress_bar.SetPos(0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BeginMaitOursor();
ProcessFile();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EndWait Cursor ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     //CDialog::OnOK();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         result • false;
temp_str.Formst! "EDRCR: Error adding simplified rules to rules file %s", fram
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meg.Format( "EXROR: unable to open simplified rules file '1s'.", m. simplified_rules.icBnpty()?"mull".m_simplified_rules );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ii(( result - initializeBuleSet ( amyjorBuleSet , a_amyjo_rulus, fp )) ii
( result - initializeBuleSet ( armbiforBuleSet , a_ambic_nules, fp )) ii
( result - initializeBuleSet ( AchimesBuleSet , a_chimes_uules, fp )) ii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if ((*ruleSet)->addSimplifiedBules( fp. processing, NUL ) .. FALSE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // This method initializes all the rules files, including the simplified rules file BOOL Of consecting: InitializeDules ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MKNAME-1.CPP 3-24-98 12:17p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               recult - false;

Juggart Former (TRROR: Missing Rules File Na", framm );

m log Additing (temp etr );

If processiog ) fprintf (processiog, "Na'n", temp_etr );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 temp_str.Format( "EXBOR: Missing rules file specification." );
m_log.AddString( temp_str );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  m_log.AddString( msg );
if( processiog ) fprintf( processiog, "is\ni_", msg );
                                                                                                                                                                received (p) ...

'validage - rev Balidage (faume );

cerp_date format( "Compiling Balies File to", faume );

ma | Lot-Andright (emp. part );

If ((rettlebel)-Andrede())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          m_log.AddString( temp_str );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if( m_simplified_rules.isSmpty() ||
  (tp = topen( m_simplified_rules, "r" )) -- MLL )
            if ( fname.lsEmpcy() •• FALSE ) ·
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  m_chinese_rules.Trimleft();
m_simplified_rules.Trimleft();
m_simplified_rules.TrimMght();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               m_anglo_rules.TrimRight();
m_anglo_rules.TrimReft();
m_arabic_rules.TrimRight();
m_arabic_rules.TrimAcft();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              result . false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         result - (alse:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        {
CString mag;
BOOL result = true;
..., R * fp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return result;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ...
```

```
EndWaitCursor();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               fclose (sorted);
                                                                                          return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return true;
                                                                                                                                      activeFile->SecMindowText(file_open_dialog.GetPathName());
m_log-ResetContent();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *sortD * new CSortDialog( this, &m_input_names );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else AfahessageBux( "No input file has been specified. Cannot sort." );
                                                                                                                                                                                                                                                                                                                                                                     H thus function is no larger necessary since sorting is now automatically done H in the process stage.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // call the sort here //cook(); // this is the function that starts the processing stuff
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OFN_EXPLORER | OFN_HIDEREADCHLT,
fileTypes(activeFileType),
NULL);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // TCOD: Add your control notification handler code here ex_irput_names.GetWindowText( m_input_names ); if( :m_input_names.laBmpty())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // thus we programaticaly switch tabs to access the rest of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // either switch to the other dialog box and do the processing // or figure out some other way \ensuremath{\prime}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      //AtaMascageBox ("This button has not been implemented yet.");
                                                                                                                                                                                                                                           elde m_log.AddString( "No active file component" );
                                                                    if (file_open_dialog.DoModal() -- IDOR) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // in disabiling this function for now // the batton this implies this has been disabled // and candered invisible in the OII // it will be exectivated when the function works youl (Menameable)s:@Everything()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sortD->Dundal();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CString sortname, msg;
int status = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     bool Offerensibolg::SortHanes()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Cortbialog
                                                                                                                                                                                                                                                                                                                                                                                                                                                      void Chirmshillg::Orisort()
```

MKNAME 1. CPP 3-24-98 12:17p

Chur short\_nameOB[256] • (0);

FILE \*sorted;

Page 9 of 12

char short\_sorthame(256) • {0};

file\_open\_dialog(true, "txt",

Gilebialog

```
//TUDO: Add your control notification handler code here activelie = 4mc_impt_names; activelie/pe = TAT;
                                                                                                                                                                                                                                                                                                              // TODO: Add your control notification handler code here active@ile • Amr_hispanic_names: active@iletype • NPM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // TODO: Add your control notification handler code here activeEile * ann_hispanic_variants; activeEileType * VAR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // TCD: Add your control notification hardler code here activefile - and processing log; activefileType - LOG;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // TODD: Add your control notification handler code here activeFile = &mc_simplified_rules; activeFileType = RUL;
                                                                                             // TODD: Add your control notification handler code here activefile • Ann_chinese_varients; activefileType • VAR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         void Offeramedholg::OnSetfocusHispanicVariants()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     void Officeanily::OnSetfocusSimplificdRules()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                _finddata_t fileinfo;
char filespec(6) • **.var*; // variant files
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  status = remove(fileinfo.name);
while(_findnext(handle, &fileinfo) != -1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    bool OwnsmedbOlg::DeleteIntermediateFiles()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // remove the *.grp files
sprintf(filespec, "*.grp");
handle = _findfirst(filespec, filleinfo);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   void OfferandDDg::OnSetfocusProcessingLog()
                                                                                                                                                                                                                                                        void OMGELLIDDIG::OnSectocusHispanicHames()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      //delece the .var files
handle . _findfirst (filespec, ffileinfo);
if(handle != -1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              void OffinamedEDlg::OnSetfocusInputNames()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               status - remove(fileinfo.name);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  long handle;
int status(0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MKNAME 1. CPP 3 3-24-98 12:17p
// Obsionse button is hit; the FileDialog that is imrobe will operate to affect // the control in question, and to have the right file defaults.

// The idea behind this is to one have so many bronse buttons, given how many file spess must be managed.

void OWsnamesDig::OSSEtCOUSKATBICRHIES!)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // TXXX). Add your control notification handler code here activeFile - &nc_chinese_names; activeFileType - 1844;
                                                                                                                                                                                      // TODD: Add your control notification handler code here activePile - Arr_arabic_rules; activePileType - MU.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // TXXX). Add your control notification handler code here activefile • &mc_arabic_variants; activefileType • VAR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -// TOOD: Add your control notification handler code here
activefile - Act_hispanic_rules;
activefiletype - 8UL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //Tuxo: Asi your control notification hardler code here activeFile * unc_anglo_names; activeFileTyp* * NGM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // TODO: Add your control notification hardler code here activeFile = fmc_anglo_variants; activeFileFype = VAR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // TUDD: Add your control notification hardler code here active File - Amc_chinese_rules; active Fileype - RUL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // TXXO: Add your control notification handler code here
activefile = Anc_arabic_names;
activefileTypo = 10M;
                                                                                                                                                                                                                                                                                                                                                                                                                       handler code here
                                                                                                                                                                                                                                                                                                                                                                                                               // TLLO: ALM your control notification activeFile = 4m2-anglo_nules; activeFileTyte = RUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    void OffcrameAtDlg::OnSetfocusArabicVariants()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               void OAcamedDDIg::OnSetfocusHispanicRules()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          void CMaumafbDlg::OnSetfocusAugloVariants()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         void Officenesticity::OnSetfocusChineseNames()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          void CAnamathDig::OrSetfocusChineseRules()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           niid OfficialisticationsArabicNames()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    void OmnamidADig::OnSetfocusAngloNames()
                                                                                                                                                                                                                                                                                                                                                         void (Menamedbolg::OnSetfocusAngloRules()
```

void OffinmedDDIg::OnSetfocusChineseVariants()

```
char commandiine (256) • {0};
sprint{(commandiine, "tpsort.com /Q % /48:30 %", (LPCTSTR) short_name)B, (LPCTSTR) short_sortname);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AtxMessageBox( "No sorted names output file specificed. Carnot sort." );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 //status - CreateProcessIMJL. // application name string
communitum. // communitum
illus. // process actibutes
// Mills. // process actibutes
// Mills. // bread actibutes
// interitene hands attibutes
// without with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string with a string 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // ok, there is a problem with the way win95 and winNT
// handle the createprocess called module when it cerminates
// I have to figure out what it is.
// until then the spawn version of the call is used
      // TODO: Add your control motification handler code here Chring southame, mag; int status = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AfAMessageBox("Could not open a blank sorted names file");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MJL, // environment
MJL, // current directory name
451, // startup info
4pi); // process information
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GetShortPathNume(nameDB, short_nameDB, double(256));
GetShortPathNume(sortname, short_sortname, double(256));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ининининининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // this was being used with the Chatefrocess function //ROCESS_INFORMATION pi: STARTUPINFO si;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // long name short name stuff
if((sorted * topen((LPCTSTR)sortname, "v")) =* MULL)
                                                                                                                                                                                                                                                                                                                                                                                     mc_sorted_names.GetWindowText( sortname );
if( sortname.lsDmpcy())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mcg.Format( "Sorting \s...", namef8 );
parent.>m_log.AddString( mcg );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            memset (ksi,0, sizeof (STARTUPLHTD));
si.cb = sizeof (STARTUPLHTD);
si.chFlags = STARTE_USESHOWNDEOW;
si.wShowMintow = SW_HIDE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        //si.wShowMindow x SW_SHOWDEFAULT;
                                                                                                                                                                                                                                          char short_nameOB[256] = {0};
char short_dortname[256] = {0};
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         status = _spuwni (_P_WAIT,
"rpsort.com",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BeginWaitCursor();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (close (sorted);
                                                                                                                                                FILE 'sorted;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // Southialog message handless
// Micropoft Developer Studio vill insert achiticual declarations immeliately before the previous line.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This stuff is no lorger necessary since the sorting stage is now part of the mettre provessing.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ///Surthulvg::Corthialog/Chai' pharent /*MAL'/, Citring 'imputiame')
// : Chialog(Corthialog::LEO, pharent)
                                                                                                                                                                                                                                                                                                                                           return (status ** 0); // this works around the old bool problem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CD:alog:DARLARCHUNF(LDX);

//([AX DRR, Wel(SartDialog)
DAC.CARCTO! [DX: ILC.|INFUSEC. m_impatapec);
DX_CARCTO! [DX: ILC.|INFUSEC. m_iorted_names];

//|]AR_DATh_WP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /*
vvid CSortbiulog::D.AutaBochunge(CDataBochange* pDX)
{
//{Ary_DkTA_INIT(CSortDialog)
//}}Ary_DkTA_INIT
prest • (Officentialog) •) pricent;
namaio • *!!putlame;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         . // TULU: Add extra cleanup here
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BEJIE PRESENCE MAP (CONTOLATO). Chialog)
//{ARX.PGT_MAP (CSOLDIALOG)
GE_EN_CATORD (IDJK, OKSORT)
//}ARX_PGT_MAP
                                                                                                                                                            status - remove(fileinfo.name);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          void (Sortblakeg::Oxtancel()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDialog::OnCascel();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ELD MESSAGE MAP ()
```

void (Sortbialog::OnSort!) {

if (natille !- -1)

Page 11 of 12

MKNAME 1.CPP 3-24-98 12:17p

ИКИАИЕ-1.СРР. 3;24-98 12:17р

may Format ("File sorted nuccestully, Saved as "is", sortname );
parent-am\_log Additing("may);
parent-am\_log Additing("The names input [lie has been changed accordingly.");
parent-am\_log Additing("The names SetWindorfox ("sortname");
parbhalog("); Obiatog: Gunitoliatog();
// Totos, Ma carte militolization here
mg. juputapec. Setkink-Virest (name3);
mg. gottog names. Setkink-Virest (name3);
mg. gottog names. Setkobust ();
eeu m Pluis; // Heturn TWIR maless you set the foots to a control
cerum Pluis; // EXETPTOR: OX Property Pages should return PMISE

\*tpsort.ccm\*,
\*70\*,
short.name58,
\*/\*8:30\*,
short\_sortname,
MALL);

ErsMattCursor();

if (status ) \* 0) // this is for spend //if( status \*\* 0 ) // this is for createprocess

may Formut ("Error sorting names file 'Ns' (Nd)", nameBB, erroo ); parent-.e\_log.AbdString( mag );

/• BOOL CSortDialog::OnInitDialog()

STDAFX.CPP 3-24-98 12:17p

Copyright (C) 1998, Language Analysis Systems Inc.

// Copyright (C) 1998, Language Analysis Systems Inc.
// stable.cpp : source file that includes just the stapland includes
// thantil pl. pch will be tra pre-compiled backer
// thantil pl. pch will be tra pre-compiled type information
// staffs.cbj will contain the pre-compiled type information

Binclude "stdafk h"

```
// Adjust the client area for the tab control's placement,
GetWindowSert(AreaThb);
GetMannel()-ServentColont (GrecThb);
M. Pett. Act or restrib. top;
M. Fect. bottom ** restrib. top;
M. Fect. Jeft ** restrib. left;
M. Fect. Jeft ** restrib. left;
M. Fect. Left ** restrib. left;
                                                                                                                                                                                                                      // Make the vindow conform to the tab control's client area.
if (m_rect.lsRactDapty())
PACATITON MARK - TCIP TEXT:
GETLAN STCLOKION;
PANN - SCHEVINGHOUTER (STCLOKION);
TACKTICEN PATENCT - (CALVI)(LICTENT) STCLOKION;
INSERTINGUINGER, ETABCT:11(CAN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Adjust the client area for the tab.

| meet. top - rectab.bottom - rectab.top:
| meet. bottom - rectab.top:
| m.rect.alt - rectab.left;
| m.rect.fight - rectab.left;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // If so, move to previous page for activation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                void ChabCtriSheet::RemovePage(CPropertyPage* pPage)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ASSERT (FRAGE (PropertyPage, phage);
ASSERT (RECOGNIC () > 1);
                                                                                                                                                                                                                                                                                                                           // Get the tab area.
Gect_rectrab;
GetItemRect(0, &rectTab);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           void ClabCtrlSheet::RemovePage(int nDage)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // Get the client area.
GetClientRect(fm_rect);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ASSERTINBage >= 0);
ASSERTINBage < Get RageCount ());
ASSERTIGETBageCount () > 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // See if this was the last page.
if (nIndex ** GetPageCount())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // See if this is the active page.
int nIndex * GetBageIndex(pPage);
if (nIndex ** GetActiveIndex())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         m_Pages.RenoveAt (nIndex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // Deactivate the page.
ActivatePage(pPage, PALSE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RumovePage (GetPage (nPage));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nIndex--;
ASSERT(nIndex >= 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // Rumove the page.
DeleteItem(nIndex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // Mulity the property pages are disabled by default;

Phage-wholifyStyle No_Disabled by default;

phage-wholifyStyle No_Disabled | No_Doorsel | No_Disable, No_OHID | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Doorsel | No_Door
                                                                                                                                                                                                                                                                                                                                                      TCSHEET.CPP 3-24-98 12:17p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // Create the tab item. 

// ROTS: This must be dame before remiting, as we must be sure to have 

// at least 1 tab to get the new dimensions for the client area. 

T_{\rm c}_1TDA Tab_Crift(em;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Call the Lage clust handler.
// NATE: This will ascert if the control is already subclassed;
if (CindArth:SabclassOlgiteminD, pWaterk);
// Enled to subclass the control.
return FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BYOL CTARACTERNMENT : SubclassDigitem(UTRT nID, CMrd* pParent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // Create the property page.
// NOTE: The property page's parent will be the dialog.
pPage-xCreate((ULIT)pPage-xq_psp.pResource, GetParent());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             m_rect.SetPectBupty(); // No client area yet...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // Madify the tub control's styles as meeded.
MadifyStyle(0, MS_GROUP | MS_TABSTOP);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       void ClabCtriShatt: AddPage (CPtopsityPage: pPage)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ASSERT(phage !* MALL),
ASSERT_KINDOF(CPropertyPage, pPage);
ASSERT(Get Farent () !* NALL);
                                                                                                                  Hitter _OBB/F;
Hebrine new OBB/F; JRW
Funket This Pile _
Gardic char This File _
File _;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // Atd page to list.
int nindex * m_Rages.Add(pPage);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CTubilt risheet:: "CTabilt risheet ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Charact Sheet .: Charact riskeet ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return TRUE;
```

// TChest opp : implementation file

Finclude "stdatk.h" Winclude "Itsheet.Hyp"

```
// If not, send the page a PSP_CARRYSIBLINGS emessage.
IRSELLT Desuit = GetPage(inindex) ->Send*essage(PSP_CARRYSIBLINGS, wharam, lParam);
if (IRSELLT : 0)
if (IRSELLT : 0)
break;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // Call each page's OrCancel hardler.
for (int nindex = 0; nindex < GetBageCount(); nindex <> GetBage(nindex) < OrCancel ();
                             IRESULT CTAKKELISheet::QuerySiblings!WPARAM wFarmm, LPARAM IParami
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Call each page's Onkpily to get results.
for (int ninker = 0: nindex < cetbageCount(): ninker**)
if (cottageIninker) *Onkpily())
// Page retured the Onkpily:
return FALSE.
                                                                                                                for (int nindex = 0; nindex < GetPageCount(); nindex++)
                                                                          IRESULT Desuit • 0; // Default to no response
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // See if the current page allows the cancel.
if (igethorivePage()-xOnOueryCancel())
// Page refused to cancel.
return PALSE;
                                                                                                                                                                  // See if this is the active page.
if (GetPage(nindex) !* GetActivePage())
[
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // See it current page will deactivate.
if (GerbarivePage()-SorKillactive())
// Page refused to deactivate.
return FALSE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BOOL CTabCtrlSheet::OnQueryCancel() const
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BOOL CTabCtriSheet::OrApply() const
{
                                                                                                                                                                                                                                                                                                                                                                                                                return lResult;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         int CTalAzitSheet::GetPayeIndex(OropertyPage' pPage) oxist
|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // Rage activated.
ActivateRage(phage, TRUE):
Gerfab/Zartrol()--SetQurSel (GetPageIndux (pRage)):
return TRUE;
                                                                                                                                                                                                                                                                                                                             BOOL CLUACEISHeet::SelbctivePage(CPropertyPage* pPage)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CPropertyPage* CTabCtrlShaet::GetPage(int nPage) const
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return (ChroputtyPage*)m_Pages.GetAt(HDage);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ChropettyPage, ClabCriShet::GetActivePage() const
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return (CPropertyRage*)m_Pages.GetAt(nPage);
                                                                                                                                                                                                                                                                                                                                                                                ASSEKT(pPage !* MUL);
ASSEKT_KHEOF(CPropertyPage, pPage);
                                                                                                                                                             BOOL CTARCERISHMEE::SetActivePuge(int nPage)
                                                                                                                                                                                                                                                                     return SetArtivePage(GetPage(nPage));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ....//
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ASSERT(nPage >= 0);
ASSERT(nPage < GetPageCount());
                                                                                                                                                                                                                                                                                                                                                                                                                                           // Attempt to activate the page.
if (pPage->onSetActive())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         int nPage • GetActiveIndex();
if (nPage ** -1)
    return MJL;
// Randra the page.
Galeteitem(nindex);
m_pages.Randrakt(nindex);
                                                                                                                                                                                                                  ASSEXT (nPage >= 0);
ASSEXT (nPage < Get Page-Count ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Puge refused to activate.
return FALSE:
```

// Son array for eatching pointer.

{or (int ninder = 0; ninder < GetBageCount(); ninder(++)
if (meribage(ninder) == pBage)
return ninder(;

// Activate the appropriate page.
page - Cethagi(ininded):
ActivatePage(plage, TMLD):
GetTalControl() - SetOurSet(inindex):

return -1; // Page not found

ASSERT (pPage != MUL!); ASSERT\_KINCO\* (CPropertyPage, pPage);

TCSHEET.CPP 3-24-98 12:17p

```
else
Sendhessage (IM_EETDOM), (WRADAN) VI_ELGHT, 0);
      if (GetActiveIndex() == (GetPageCount() - 1))
Senthessage (Me_ISTICAN; (HPARAM) VI_HOR), 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         void CTabCtrlSheet::OnSelchanging(MMGDR* pMMGDR, IAESULT* pResult)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             void CTabiliSheet::OnSeldhange(MMER: pMMER, LRESULT: pResult)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BEDIN JASSACE JAN (TRADCTISNEEL, CTADCTI)
//(||Arthur Jacophacelisheel)
or intrey_restactions/secondors, oseldanging)
or juriey_restact(tov_secondors, oseldange)
///||Arthur jastact(tov_secondors, oseldange)
BD_MESSACE_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        void CTabCtrlSheet::setClientRect(CRect 'newRect)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // See if current page will deactivate.
CPropertyPage* pPage * GetPage(GetCurSel(!));
if (pPage*>ONKillActive(!))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // See if nrw page will activate.
CPropertyPage* PPage * GetPage(GetCurSel(!);
if (pPage->OnSwtActive())
                                                                                                                                                                                                                                                                                                                                             // Call the base class handler.
return CTabCtrl::PreTranslateMessage(pMsg);
                                                                                                                                }
return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // Page refused to deactivate.
*pResult = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Page refused to activate.
*pResult • 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // Page deactivated.
ActivatePage(pPage, FALSE);
'PResult = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // Page activated.
ActivatePage(pPage, TRUE);
*pResult = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    m_rect = newRect;
                                                                                                                                                                                                                                          -
break;
                                                                                                                                                                                                                                                                                                                                             // See if window is being activated or deactivated.
if (Increase)
// Activate the page.
// In restict the window.
page.>SerwindowPos (Mills, m_rect. Topleft () .x, m_rect. Topleft () .y, m_rect. Width(), m_rect. Weight (), 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // 2. Position the window.
phage-scenindomedosiemedoctom, 0, 0, 0, 0, smp_axzizz | smp_ixxore | smp_ixxactivate);
                                                                                                                                                                                         void CTadicelShaet: ActivatePage(CPdopertyPage* pPage, BOOL fActivate/* + TAUE/)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // 2. Nozity the page.
NAMER meter * (m_bMed, 0, PSI_SERACTIVE);
phage-Senthessage(M_IOTIFY, (MPNAM) meter.idfrom, (LPRAM) emiter);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                [// Leartivate the page.
// ) 1967(tr be page.
1969 endr. (miMed. 0, PSH KILLACTIVE);
pRage - Senfecisoge(M.INTIV, (MPROM)mmtx.idfrom, (LPAGM)Emmtx);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else
Serdhessage (M. IXXXXXN), (MPARAN) VK_LEFT, 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (GetActiveIndex() == 0)
SendWessage(WM_KEYDOWN, (WPARAW)VK_END, 0);
void CTalCiiSheet..AciivatePage(int nBage, BOOL EActivate/* • TRUE*/)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // Let the page handle commands.
return GetActivePage()->IsDialogMessage(pMsg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // See it moving backward.
if (GetKeyState(VK_SHIFT) < 0)</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                case VK_TAB:
if (GetKeyState(VK_CONTROL) < 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BJOL CTabitelsheet::ProTranslatcMussage(MSG* pMsg)
{
                                                                                                                                                                                                                                                                     ASSEKT(pP.ge := NUL);
ASSEXT_KLEOF(CPropertyPage, pPage);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // See what the current mussage is.
                                                 ASSECT (nPage >= 0);
ASSECT (nPage < GetPageCount ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // 3 Show the vindow.
pPuge->Showlindow(SW_SHOW);
```

// 1. Hide the window. phage-Showlindow(FALSB);

//----//

ActivatePage (GetPage (nPage));

TCSHEET.CPP 3-24-98 12:17p

case WM\_KENDOMM: switch (pMsg->wPaxam)

switch (pMsy-Amissage)

CASE VK\_RETURN:

TCSHEET CPP 3-24-98 12:17p

// TUCO: Add your message handler code here

ConquityPage "pPlage = GeckettwePage();

1f (pPage := NALL) {
 ActivatePage(pPage);
}

```
// Since the dialog has been closed, return FALSE so that we exit the // application, rather than start the application's message purp. return FALSS.
\ensuremath{//}\ensuremath{/}\ensuremath{\text{TCCO}} . Place code hare to handle when the dialog is \ensuremath{//}\ensuremath{/}\ensuremath{/}\ensuremath{/}\ensuremath{\text{timissed}}\ensuremath{\text{vith}}\ensuremath{\text{Cancel}}\ensuremath{\text{I}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // Call this when using MFC in a shared DLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TDSUTT1.CPP 3-24-98 12:17p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // Call this when linking to MFC statically
                                                                                                                                                                                                                                                                                                                            BB3111 JESSACE_MAN (CTICALLI) DJAPO, OKINĀÇO)

//(LAY_EGS_ARA_CTICALLI) DJAPO

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DQ (COPARDID_IRLA), OKINĀPO:(CHRAD)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // Standard initialization
// If you are not using these features and wish to reduce the size
// of your final executable, you should remove from the following
// the specific initialization routines you do not need.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // TKD): aid construction code here,
// Place all significant initialization in Initinstance
                                                                                                                                                                   Reption for Obsig Red
Furbit THIS FILE
gratic char THIS FILE() - __PILE__;
scatif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BOOL CIMENtil_p2App::InitInstance()
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Enable3dControlsStatic();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Chasuril_p2App::Chasutil_p2App()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Crisucil_p2Dlg dlg;
m_pMsinMrd • sdlg;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 #ifdef _AFMOLL
Enable3dOmtrols();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   //std::ofstream eff;
//@istance soundistance;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CTdSucil_p2App theApp;
                                                         minclude "distance.h"
minclude "cgrep.h"
                                                                                                                         andude efstreams
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    #endif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #el Se
```

// TUDO: Place code here to handle when the dialog is // dismissed with  $0{\rm K}$ 

H (douti)  ${f p}$  Cyp : Defines the class behaviors for the application.

#include "stdafx.h"
#include "tdsutil\_p2.h"
#include "tdsutil\_p2D19.h"

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in ribesponse = dig.Dowodal(); if (ribesponse = DOK)

else if (nResponse -- IDCANCE.)

```
pSystem - »Appendrum (MF_SEPARATOR);
pSystem - »Appendrum (MF_STR.U.S., LTM_ABOUTBOX, strAxxucMem.)
//(AF_AND_DIT(CTAGALIL_pDitg)
//NOTE: the Classicard vill add owner initialization here
//Note that Loadion dees not require a subsequent Destroylom in Winl2
e_hicon - Addectqp() - Joadion(ITR_MADMRWS);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // Set the icon for this dialog. The framework does this automatically // when the application's main vindos is not a dialog Settonia, bloos. TRUS);

Settonia, bloos, FALSS);

// Set anall icon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  recurn TRUE; // return TRUE unless you set the focus to a control
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // ILM_ABOUTBOX must be in the system command range.
ASSEXT(ILM_ABOUTBOX & OAFRO) ... ILM_ABOUTBOX);
ASSEXT(ILM_ABOUTBOX < 0xF000);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           void Cidsucil_piblg::OnSysCommand(UINT nID, LPARAM lParam)
                                                                                                                                                                                                                                                                                                           world CTdsucil_p2Dlg::DoDetaExchange(CDataExchange* pCK)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ciring straboutMenu;
straboutMenu.LoadString(IDS_ABOUTBLX);
if (!straboutMenu.IsBnpty())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // Add "About..." menu item to system menu.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Otenu* pSyathern • OutSystemmeru(FALSE);
if (pSystem !• NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // add the pages here
m_tabCtniSheet.AttPage(#WnamedtDig);
m_tabCtniSheet.AddPage(#ConvVarXotp);
m_tabCtniSheet.SetActivePage(#WnamedtDig);
                                                                                                                                                                                                                                                                                                                                                                                CDialog::Dobusbocharge(pCK);

//{hAr larm, Moe(cribatii p20)g)

DOX_CONTrol(pCK, DC_TABI, m_tabCtrlSheet);

//}}Arx_DATD_yap
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BETTH PRESENCE FAR (CTREATED PATH)

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if ((nID & OXFFFO) .. IDM_ABOUTBOX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BOOL CIdsutil p2Dlg::OnInitDialog()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Cabouthing digabout;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Dialog::OnfritDialog();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10su11 2.cpp 3-24-98 12:17p
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     virtual void toChataExchange (ChataExchange* pDX);
//]kax_viRTuAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CTdoutil_piblg::CTdsutil_piblg(CMrd* pParent /*iMfL*/)
: Obialog(CTdsutil_piblg::IDO, pParent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // ClassWizard generated virtual function
//{{Arr.virtual(Obcourbig)
protected:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               void ChixutDlg::D.OutaExchange (ChataExchange* pOX)
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                                                                                                // tdoutil_plblg.cpp : implementation file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BECILI_MESSACE_MAP(Chouchly, Chialog)
//{\Arx_MSC_MAP(Chouchly)
// to message hardlers
//}\Arx_MSC_MAP
                                                                                                                                                                                                                                                                                                                                                                                           nitet _DRPG
Prefine now CEBS_BEA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // Dialog Data
//{{Arx_Data(CaroucDlg)
enum { ID * ILD_ABCUTBOX };
//}}Arx_Data
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         //{{afx_data_init(cabodidig)
//}}afx_data_init
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//{{afx_Dafa_Maf (OboutDig)
//|}afx_Dafa_Maf
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              //{{AFX_MSG(CAboutD1g)}
//}}AFX_MSG
DECLARE_MESSAGE_MAP()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            class Cabatolg : public Chialog
                                                                                                                                                                                                                     #include "stdafx.h"
#include "tdsucil_p2 h"
#include "tdsucil_p2Dlg.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Character ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // Implementation protected:
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```

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```
Page 2 of 2
```

```
// The system calls this to obtain the cursor to display while the user drags // the minimized vindow.

HIGHSON CHENTIL DIDGE: ORQUERYDONGLED()
                                                                                                                                                                                                                                                                      Senzhessage (MM_ICCNTERASEBKGLD, (WPARAM) dc.GetSafeHdc(), 0);
// It you and a minimise bettom to your dialog, you will need the code below if to district the control of the forest applications using the document/view model. // this is automatically done for you by the framework.
                                                                                                                                                                                                            ChaintDC dc(this); // device context for painting
                                                                                                                                                                                                                                                                                                                         // Center icon in client rectargle
int cuicon - desSpiremMetrica(Sp_CXICON);
int cylcon - desSpiremMetrica(Sp_CXICON);
ORCI rect;
ORCI rect;
Int x - (rect; Midth) - calcon + 11 / 2;
int y - (rect; Helpht() - cylcon + 11 / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // braw the icon
dc.DrawIcon(x, y, m_hIcon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (Dialog::OnPaint();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return (HCLRSCR) m_hlcon;
                                                                                     void Cfdsutil_p2Dlg::OnDaint()
{
                                                                                                                                               if (folconic())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else
```

(Dialog::OnSysCommand (nID, 1Param);

digabout, Domodal (), ;

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```
// this is the heaker file for the code to convert from whilart to the nameric encoding // that we internally call group. Note: this is different from the Odd group which is // the an Unarter. Our group is an encoding of a new consisting of 10th characters // into a numeric representation of which group of the characters a character in the // neme corresponds to. This is done using the grouparray dat file which contains the // group assignments for each valid IN character. grouparray dat the which contains the and is used as a lookup table.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HIT IGETIMENTARY, CONVADICATE H. SCOSAZAL (SECO. 11D1, 837A, 0000F820F4AA_UXCLUDD.)
HARTINE AFX, CONVADICATE H. SCOSAZAL (SECO. 11D1, 837A, 0000F820F4AA_UXCLUDD.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CEMIL a gen induces we ben in a gen induces we ben in a gen induces in a gen induces in a gen induces in a gen induces in a gen induces in a gen in
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enum { IDD = IDD_CCANERT_WR_TO_GRP };
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m_auto_gen_source_file_box;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     chasa CCom/Var2Grp : public CPropertyPage
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Apragns warming(disable: 4786)
Rdefine NIMIRMAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tendit // MSC_VER >* 1000
// ConvVarSGrp.h : header file
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"CConvVar2Grp();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sinclude cuse_ansi.h-
sinclude ciostream
Sinclude cuterator>
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sinclude catorithm
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#include <fstream>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mit MSC_VER >= 1000
Mpragna once
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // Dialog Data
```

CEMIR B. STP\_Offsets\_max\_b CEMIR B. STP\_Offsets\_avg\_b CEMIR B. STP\_LON\_MAIN\_DEX; CEMIR B. STP\_LON\_MAIN\_DEX; CEMIR B. STP\_LON\_MAIN\_DEX;

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// Crerrides

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n\_nn\_unique\_groups\_created\_box;
n\_num\_unique\_variants\_box2;
n\_unique\_groups\_box;
n\_nnm\_groups\_tox exi
n\_nnm\_groups\_tox exi in box;
n\_grp\_offsets\_min\_box;

CZIII m sort groups source box;
CZIII m dechpe group source box;
CZIII m dechpe group source box;
CZIII m dechpe group dest box;
CPOGIESSCII m progress bar;

œ.

CProgressCtrl CEdit m.num.u

```
char m_group_array(256); // used to store the encoded name, this was called group before we found out 
// ORD dubt't want to due that word. Unfortunately its all over the place so 
bool m_auco_tlag; // used to control what musaages get displayed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             //{[AFX_DGEGT_LOCATION]}
// Microsoft Developer Studio vill insert additional declarations immediately before the previous line.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Publication (result) (initialize the ips array into its groups bool intifferoptivity). // initialize the ips array into its groups bool intifferoptivity (initialize vinit), // deaplicate variants file void convertvariety) (initialize vinitialize vinitialize variants file bool drouptly (Giring v. Giring v.); // convert to groups out drouptly (Giring v. Giring v.); // convert to groups out drouptly (Giring v. Giring v.); // west for title browning void Greatchelerusigned char v. unsigned char v.); // yet ind of double characters bool dementacheous (Giring v. Giring v.); // great of could be actual indees bool dementacheous (Giring v. Giring v.); // generate the actual indees bool beneatmentacheous (Giring v. Giring v. Giring v.); // generate the actual indees bool beneatmentacheous (Giring v. Giring v. Giring v.); // generate the actual indees bool beneatmentacheous (Giring v. Giring v. Giring v.); // generate the actual indees bool beneatmentacheous (Giring v. Giring v. Giring v. Giring v.); // generate the actual indees bool beneatmentacheous (Giring v. director).
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                                                                                                                                                                                                                                                                                                                                // DDX/DDV support
                                                                                                                                                                                                                                                                         virtual void DobataExchange (ChataExchange* pCK);
//}}arx_virtual.
// ClassWiard generate virtual function overrides
//([Arg.VirtuaL(Clarwiaractp)
procered:
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// (IntX_SEGIONANEATOR)
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atx_meg void OnDeAliSteps();.
atx_meg void OnClearTorpPilesBun();
//|)lax_HGG
DECLARE_MESSAGE_MAP()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // functions / methods
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  bool m_auto_flag;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // Implementation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // members
private:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protected:
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#ifndet DEF\_INWERDE\_FILE "names.nameree" #eedit

// Ctp/right (C) 1999, Language Analysis Systems Inc. // the Cefumes . sinche . Essues ; sinche . Essues ; side time \_ESFUES. H #itndet FEATURE\_DIST\_FILE "fdist.dat" #datine FEATURE\_DIST\_FILE "fdist.dat" #erdif withher MAX juves\_Line\_LEN
Modefine MAX juves\_Line\_LEN 500
#endit mitndet MAX\_EANE\_SIZE Ndefine MAX\_EANE\_SIZE 30 Hendif

Witchel DEP JAMES FILE "names.txt" Newfile DEP JAMES FILE "names.txt" #itraket DEP\_RULES\_FILE #detine DEP\_RULES\_FILE "angl.rul" Wendit sitrakt OEF\_EXPANDD\_IBMES\_FILE Nacine DEF\_EXPANDD\_IBMES\_FILE "expanded\_names.txt" Wendit

```
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```

// akounedbDlg.h : hauder file // BIT (defined(AF MORMERENC H\_384ACS7\_6280\_1101\_8508\_004005209C7\_DMCLEND\_)
Hatine AF MORMERENCE H\_384ACS7\_6290\_1101\_8508\_004005209C7\_DMCLEND\_

#16 \_MSC\_VER -- 1000

//ObcamedDig(Ohd\* pParent = MIL); // standard constructor ObcamedDig(); \*\*ObcamedDig();

```
"aelidoff{u|}"
(strchr(theVOWELS, ch) != NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                     // These values define the possible errors that may occure during
// the building of the intial name detained files.
/// Meditine to gramma of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of
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}
                                                                                     // vowel-initial variants codes, see ranker.h for the master declarations. So labeline DDM_CV ^{1}S^1 selection DDM_CV ^{1}S^1 selection CMX_C ^{1}S^1 selection CMX_C ^{1}S^1
                                                                                                                                                                                                                                                                                                                                // maximum length of line in input file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // 'ncardard' file extension indicator for browse file dialog box 
// these tell the dialog box what file types to bring up by default 
averine TUL 
1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  section BEGGE EDGNS 5 // bad regular expression
section BAGGE 6 // no spece between groups and name
staction FILE BAGGE 7 // norm file was not opened
section FILE BAGGE 9 // an input file was not opened
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // The following-section is required by PC-NAS. . //#define NAWE_SIZE MAX_LEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // use the version of these in parse.h
//Wdefine theVOWELS
//Wdefine is_VOWEL(ch)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // RuleSet class and related classes
                                                                                                                                                                                                                                                         // some delines for name processing // satine MAX_IN_LER: 50 // m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mpragma warning(disable: 4786)
using namespace std;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // the name length limits
Modefine MIN_LEN 2
Modefine MAX_LEN 30
lendit // _MSC_VER >= 1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 #include <use_ansi.h>
#include <map>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      #include <nas.h>
// end PC-FDS set up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        #define NOMINMAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mdefine NAM
Mdefine VAR
Mdefine LOG
```

```
#endif // :defined(AFX_Me3WMEDEDIG_H_384ACSS7_629D_11D1_BS08_004005209C37_INCLURED_)
                                                                                                                                                                                                      // Classwizard generated virtual function overrides
//{{Arx_virtual_Cortbialog}}
//{{Arx_virtual_Cortbialog}}
//{{Arx_virtual_cortbialog}}
//{{Arx_virtual_cortbialog}}
//{{Arx_virtual_cortbialog}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // Cenerated message map functions
//[lax_gotGotchisalogs]
virtual void orGotchis
afx_map void oxfort();
afx_map void oxfort();
//!lax_got
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DECLARE MESSAGE MAP ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // Implementation
protected:
                                                                                                                                                                           // Overrides
// the mean method for going through the names in the file
void ProcessFile():
// methods for getting files, rulesets, etc. initialized before processing
GOOL InitalizedDes(). InitializeDueSet (RuleSet **nuleSet, CString fname, FILE *fp ).
                                                                                                                                                                                                                                                                          // a utility method to open a file in a particular mode, and report errors 
BOM. OpenFile( FILE **file, Catring frame, char *flags );
                                                                                                                                                                                                                                                                                                                                                                                                                                        // a method to process the variants for a given input name long Process/visited (String input, Cityley input, char 'group', maripad long id, pariest 'through', maripad long id, pariest 'through', unsigned long 'officet, Fills' roam, Fills' vouc. Girthy independent, int line ); // a utility method for reporting errors to the user voud 'meportary' (int error, Citring input, int line is bold Sorthames);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // Generated message map functions
//(LAX) performers bid
virtual BooL oninitialed!)
d. ac. may ouid ocsyclomeand(Ultrn Di. LPADAM I Baram);
d.c. may ouid ocsyclomeand(Ultrn Di. LPADAM I Baram);
d.c. may influence of orbaling it.
at. ac. may influence orbaling it.
virtual void orbaling it.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    at it gost out described to the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           bool DeleteIntermsdiateFiles();
```

//{{AP\_DKT/CSortDialog}}
ern { Ino IND\_SKT\_DIALOS };
CStatic m\_imputape;
CStatic m\_straf\_names;
//}{APY\_DKT/

// Dialog Data

int activePilatype:// the active file control type (rnd, .dm, etc.)
// These are the file open for input and output during processing FILE 'urputismes, 'processing,
'urputismes, 'processing,
'anabidout, 'arabidout,
'chineseDut, 'chineseDut,
'thipsmidfout, 'thipsmidfout,

Page 2 of 2

CortDialog(OAtd\* pRarent - NJLL, CString 'inputiame - NJLL ); // standard constructor

class Corthialog : public Dialog

// Construction

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INC. SORT GROUPS, SOURCE, PTLIS, BTN	Reffine IDC SORT GROUPS DEST_FILE_BIN 1043	IDC SORT GROUP SOURCE BOX	IDC_SORT_CROUPS_DEST_BOX	H I	5	IDC DEDUPE CHOUP SOURCE BOX		IDC GEN INDEXES SOURCE BOX	IDC GEN INDERES IDX FILE BIN	1 - Machine IDC CRN INDICKS UND BOX	SUC	IDC DR PROCRESS BAR	#define IDC CLEAR TEMP FILES BIN 1063	#Gefine CG_IDC_PROCEDUS	Side Trecogn Dictors Co. Dictors 1066		// Next default values for new objects	<i>" -</i>	#ifdef APSTUDIO INVOKED	#define APS NEXT COMMUND VALUE 32771	#define APS NEXT SYMED VALUE 102	#endif	Hendit						-	 _	_					_	_	 		· <del>-</del> ·	 	 	
					,															-					-													n	en)î	· ·		•	
// Used by Edsucil p2. FG		ILU ABOTTBOX 100	TECTTARY 1001	TL P2 DIALEG	_		II.R MALIEPIAME 128	CC LLD PACKETS VAR TO CRP 132			IDC_SORT_DIALD?	POX2	IDC HISPANIC RULES 1003	•		IDC_BROWSE 1006	IDC_ABOUT		STI	IDC_DEST_FILE_BOX2 1013	IDC_BRUNSEJ	FILE		IDC_BRCMSE4 1016	IDC_ALSID_IMMES 1018	EŽ.	XOE IN DOX	IDC_AUTO_GEN_SOURCE_BITN () 1018	ARIANTS BOX	IDC_AUGIO_VARIANTS 1019	THE REPORTS LIKE LOG 1020	X	 IDC VAR LESI MAX BOX 1022	23	_	IDC_CHINESE_VARIANTS 1023	THE WAY LESS AND BOX 1025			Identine IDC_VAR_OFFSETS_MIN_BOX 10.29		IDC_PROCESS2 1034 TEC MAIN PRICES VARIABLES HOX2 1035	Iduiting IDC_NUM_UNIQUE_VARIANTS_BUX2 1035

```
CAPTIGHT (C) 1998, Language Analysis Systems Inc.
```

```
//{[AF_DGIST_LOCATION]}
// Micropoft Developer Studio vill incert additional declarations immediately before the previous line.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // MFC support for Windows Common Controls
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aenit // idefinediakx_sTDakx_H_49560109_sG04_ilD1_8377_0000F820P4JA__INCLUDED_}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // Exclude rarely-used stuff from Windows headers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         #16 (defined IATA, STANTA, H., 49560109, SD04, 11D1, 8172, 0000 P120 PA., DECLIDED.)
#define ARY_STARY_H. 49560109, SD04, 11D1, 8172, 0000 P120 PA., DECLIDED.
H stats.h.: include files for standard system include files, H or project specific include files that are used freepantly, but here changed infrequently
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   #Include catevin.b // MPC core and standard components .

#Include catestr.b // MPC extensions
#Intract_MAY_NA_MACM! SIMPORT // MPC extensions
#Intract_MAY_NA_MACM! SIMPORT // MPC export for Windows
#Intract_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_NA_MAY_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               #prigna crice
#prigna crice
#endif // _MSC_VER >* 1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                edetine VC_EXTENLEM
```

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```
//(|ax| nspr_{LOOTION}|) // Microsoft Developer Studio will insert additional declarations immediately before the previous line.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 //(AMY WOXICTBOACH) pDApp)
// NOTE: the ClassWitard will add and remove member functions here.
// NO NOT DDIT what you see in these blocks of generated code !
//)|AMY WOXI
// Overrides
// Cleashizard generated virtual function overrides
// (Asy_intub_(Chievil_p0App)
public:
virtual Bot Intifuctance();
// }Asy_vRIUU.
                                                                                             class CTdsutil_p2App : public CWinApp
                                                                                                                                public:
CTdsutil_p2App();
                                                                                                                                                                                                                                                                                                                       // Implementation
```

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without \_AFMMIM\_\_ error include 'stdafx.h' before including this file for POM

// Capyright (C) 1998, tanguage Avalysis Systems Inc.

H cosmilgen so on bewee file for the DSVTL P2 application H

Hit MSC VER >= 1000 Hprisgna once

#endif // \_MSC\_VER .\* 1000

// main symbols finclude "rescurce.h"

```
Page 1 o
```

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// tdoutil\_p2Dlg.h : header file // TDSUTI-2.H 3-24-98 12:17p

```
7. Create a handler for the MH_CDMMID message, and implement as follows:

BOOL Croumbialog::PremvanslandMessage(NGS* phsg)

{

    Override or create a handler for the dialog's Ordancel () werber and
handle the processing something like:
void Ordantialog: Ordancel ()

                                          4. In your Chialog-derived class's Oninitibialog member, subclass the control, and initialists the pages like:
a preer; absclassinglerer(IDC_TAB_CONTROL, this);
a_sheet. Addrage(fa_ThisPage);
a_sheet. Addrage(fa_ThisPage);
a_sheet. Addrage(fa_ThisPage);
a_sheet. Addrage(fa_ThisPage);
a_sheet. Addrage(fa_ThisPage);

3. Also in your Chialog-derived class, create instances of the pages in the header file, like:
Chialogo m_missage;
Chialogo m_missage;
Chialogo m_missage;
Odnichago m_Mischage;

    In your Chialog-derived class, create an instance of this class
in the header file, like:
CractiSheet m_shet;

    Create your dialog resource, placing and sizing the tab control
as desired.

    Overrido or create a handler for the dialog's GnOX() member and
handle the processing something like:
void CYoutDialog::GnOX()

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // See if the sheet hardles it.
if (m_sheet.ProTranslateMessage(pMsg))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // See if sheet is satisfied.
if (!m_sheet.OnQueryCancel())
return;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // Allow DOX/DDV validation.
if (!OpduteData(TRUE))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // Allow steet validation.
if (!m_steet.OnApply())
return;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // End the dialog.
Chialog::OnCancel();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // End the dialog.
CDialog::OnOK();
Autock CTABCTRISHEET H
```

m\_Pages; // Array of CPropertyPages m\_rect; // Client area of tab control

// Attributes public: CPtrArray

CRect

// Overridable Operations/Implementation

public: virtual BOOL virtual void virtual void virtual BOOL virtual BOOL

// Some Oproperty/Page menters are implemented in this class and abould be used if when using this class. They are: // Queryshabings()

class CTabCtrlSheet : public CTabCtrl

// Construction/Destruction

CTabCtrlSheet();
virtual 'CTabCtrlSheet();

// Several OroquetyPage members are not implemented and should not be called.

// They are
// Conceitoclose()
// Severalized()

| It should be noted that the parent of your OpropertyPages is not a | OpropertyPages to the is your Obladag-derived class, and therefore references | OpropertyPages to the parent window should be handled appropriately. | OpropertyPages | | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | OpropertyPages | Opr

// Call the base class handler. return Colalog: Prefronslatchessage (pMsg);

return TRIB;

// TCShget.h : header file // Page 1 of 2

GetActiveIndex() coust { return GetTabControl() - XetOurSel(); } GetPageCount() const { return m\_Pages.GetSize(); } GetTabControl() const { return (CTabCort\*) this; }

// Generated message map functions protected:

TCSHEET:HPP 3-24-98 12:17p

virtual int virtual int virtual CTabCtrl\*

.> CRect 'newRect);

ActivatePage (int nPage, BOOL IActivate • TRUE); . ActivatePage (CPropertyPage\* pPage, BOOL IActivate • TRUE); PreTranslateMessage(MSG\* pMsg);

virtual void virtual void virtual BOOL

OnQueryCancel () const.;

virtual ChropertyBage virtual ChropertyBage virtual ChropertyBage virtual LABSUT virtual BOOL virtual BOOL

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Page 2 of 2

## **PCNAS**

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T_{\rm c} (Satechold musasge bardlers
                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDialog::DtataBachunge(pDX);
//(Art Onth, May Consciolig)
DX_Control(gdx, IDC_RESULTS_LIST, mc_reaults_list);
DX_Control(pdx, IDC_RNING_FILE, mc_fileedit);
///)Arx_Onth_Mo
                                             // Copyright (C) 1998, Language Analysis Systems Inc.
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[//[Alx] KOS, WANGCALCHDIG, CDIALOS)

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OI BY CLICEDSTINC, STRWIT, ONSLIMAT)

DEL MESSACE, MAPI.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             void ChatchDig::DoDataExchange(ChataExchange* pOX)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ClutchD[g::CBatchD]g(OMtd* pParent /**MIL*/)
: CDialog(CBatchD[g::LDO, pParent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (NatchOlg::CacchOlg(nus *my_nus)
: Oialog(ChatchOlg::IDD, MALL)
                                                                                                                                                                                                                                                                                 //{(AFX_DATA_INIT(CBatchDlg)
//}|AFX_DATA_DIIT
)/ Batch.cpp : implementation tile
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Obialog::OnInitDialog();
                                                                                                                                                                                                                Opragna Wathing(disable: 4786)
using namespace std;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BOOL CBatchDlg::OnInitDialog()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    iseu ka - seu π
                                                                                                                                                #define NYMINWX
Binclude <use_ansi.h>
Winclude <map>
                                                                                                                                                                                                                                                                                                                                                                                                  #include "nas.h"
#include "BatchDlg.h"
                                                                                    Winchese "stdofk.h"
Winchese "pomas.h"
```

int rc + m\_nas-batch\_resting(fin\_name, four\_name, 'NoMer');
if (rc += 0)
nc\_results\_list.AddString("Mesults are in the file \* - tout\_name);
else {

mc\_results\_list.ResetContent(); CString fin\_name, fout\_name = "batchout.txt"; mc\_fileedit.GetWindowText(fin\_name); CString may:
may: Jonate ("Extra #14 in batch processing.", rt);
may: Jonate ("1s.", a., Addstring(may);
may: Pormate ("1s.", a., na.-spet., massage(rt));
nc\_results\_list..AddString(may);

Critebialog file\_open\_dialog|true, \*tx\*, \*\*.tx\*,
ON\_EXPLORE | ON\_HIDSELORE;

"The file (\*.tx!) \*.txt |All files (\*.\*)|\*.\*||\*,
NALL);

if (file open\_dialog Dorthal() == DOM) {
 rc\_fileedit.SetWindorDott(file open\_dialog GetPathName());
 rc\_rendits\_list.ResetContent();

// TODO: Add extra cleanup here

void ChatchDlg::OnCancel()

Oialog::OnCancel();

void ChatchDlg::OnSubmit()

// EXCEPTION: OCK Property Pages should return PALSE

void ChatchDig::OnBatchBrowne()

Page 1 of 1

BATCHOLG, CPP 3-24-98 1:11p

return TRUE; // return TRUE unless you set the focus to a control

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// Construction
public:
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// Call this when using MFC in a shared DLL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HITHER THE AND CONTROLLED THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE 
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// Place all significant initialization in InitInstance
// pures.cpp : Defines the class behaviors for the application.
// Copyright (C) 1998, Language Analysis Systems Inc.
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Enable 3dControls();
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using namespace std;
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Ninclude cuse_ansi.h-
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#include "pchasDlg.h"
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#include "pchas.h"
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                                                                                                                                                                                                                                                                                                                       #else
```

// Since the dialog has been closed, return FALSE so that we exit the // application, rather than start the application's message pump. return FALSE:

// TOOO: Place code here to handle when the dialog is // dismissed with Cancel

else if (nResponse -- IDGMCEL)

// TCDO: Place code here to handle when the dialog is // dismissed with OK

Ordersolg dig:
m\_ptairend = edig:
int nResponse = dig Detectal();
if (nResponse == DOM)

PCNAS.CPP 3-24-98 1:11p

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ALL // :declared tark proper if 02957A65_1861_LILL 9316_00006624F0509_INCLIDED.)
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LEGILER ANY POLS H\_ 02357A65\_1861\_011\_1891\_00006242A59\_1867\_0000624850\_1867\_011\_1891\_0000624859\_1867\_000062485

// porus.h : main beader file for the POBS application
// copyright (C) 1998, Languaga Analysis Systems Inc.

\*ifradef \_AroutH\_\_ Rerror include 'stdatx.h' before including this file for PCH

#pragna cnce #cndif // \_MSC\_VER >= 1000

PCNAS.H 3-24-98 1:11p

```
Page 1 of 3
                                                                                                                 Centerwindow(): return TRIE unless you set the focus to a control return TRIE; // return TRIE unless you set the focus to a control return FALSE // EXCEPTION: OCX Property Pages should return FALSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //([AR_DATA_DITT(GCDASD]9)
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DEVELOP_STR. NAMEZ);
SetDigitemText (IDC_VERSION, string_bul);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Crossilg::Crossilg(Cend* placent /*-Mill*/)
: Oblog(Crossilg::ID; placent)
                                                                                                                                                                                                                                                                             BEDIN MESSATE MR (CHONTED) 9, (Disalog)
/// (ART MSC MR (ChoutD) 9)
BED_MESSATE_MR ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (m nas :* NUL.)
delete m nas;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Chenasolg:: Chenasolg()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PCNASDLG.CPP 3-24-98 1:11p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // Classwicard generated virtual function overides
//[[AR_VIRTDAL(CASOUTD]9]
proteccel-
proteccel-
virtual void DianciaExchange(ChacaExchange, pox); // pox/pov support
//|]AR_VIRTUAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      void Chauchle: DabataExchange (ChataExchange* pDX)
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//{arx_parn_mar(CaboutDlg)
//}brx_parn_ma?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /(APX_MXS(ONDALEDIG)
virtual 9YOL OHINEDIALOG();
//}]AFX_MXG
DECLARE_MESSKAE_MR()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   //{(AFX_DATA_INIT(CAboucD1g)
//}}AFX_DATA_DHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // Dialog Data
//{Rax_dath(CalcoutD1g)
enum { IDD * IDD_ABOUTBOX }:
//}Nax_path
                                                                                                                                                                                                                                                                                                                                                                              witder _DEBUJEA

Hodefue new DEBUJEA

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Scaric char THIS_FILE...
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            class Chrouthly : public Chialog
                                                                                                                                                                                                                                                                     epragna warning(disable: 4786)
using namespace std:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        #include "ras.h"
#include "pcnasOlg.h"
#include "batchOlg.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               n
public:
Cabourblg();
                                                                                                                              How time HOMINGWAX
Binclude cuse_ansi.h>
pinclude cmap>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // Implementation protected:
                                     #include "stdafk.h"
#include "pcnas.h"
```

Cayyright (C) 1998, Language Analysis Systems Inc.

مشخاط م دورانور

```
m_nas = new nasions::NAS_NADBIC, "egamens dot", "egai.dot", "egatri.dot",
"annews dot", "estinich dot", "egatri.dot",
nas::NAS_CHORSES, "egamens.dot", "egatri.dot",
"cramens.dot", "egat.dot", "estin.dot",
nas::NAS_HSPANIC, "egatri.dot", "egatri.dot",
"hammes.dot", "batri.dot", "hatri.dot", "hatri.dot",
"hammes.dot", "batri.dot", "hatri.dot", "hatri.dot",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // Set the room for this dialog. The framework dues thus automatically // when the application's main window is not a dialog settlemie hroon, TRIBE; // Set big icon application, FRISE; // Set small icon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       pSystemu->Appendienu (Mr_SEPARATOR);
pSystemu->Appendienu (Mr_STRIB;, IEM_ABCUTEOX, strAbcutMenu);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PROGRAM TONE, VERSION PAJOR, VERSION MILER. DATE.,
DEVELOG.STR, 1994(2);
SALDIGIT office (LDC_STR/FIC_MEADER, temp. SET);
or programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programment of the programmen
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // IIM_ABOURDX must be in the system command range.
ASSERT(IIM_ABOURDX & OAFFO) -- IDM_ABOURDX);
ASSERT(IIM_ABOURDX < OAFFO);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tomp_str.Fount("1.1f", m_nas-yee_cs_threshold());

ca_chreshold(serkinback(temp_str);

ca_p_str.Fount("1.1f", m_nas-yee_b_chreshold());

m_h_threshold(serkinback(temp_str);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CString strAboutMenu;
strAboutMenu.LoadString(IDS_ABOUTBOX);
if (!strAboutMenu.LsEnpty())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Add "Axxit..." menu item to system menu.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CString temp str;
temp_str.Format("1s Version 1d.1d (1s) \n"
1s\n" 1s",
"rector HAJOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Chuna psysMenu - GetSystemMenu(FALSE);
1f (psysMenu !+ (NLL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         mc_nume.SetLinntText (NAME_SIZE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Chialog: :OnInitDialog();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BOOL CPcracDig::OninitDialog()
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // CPcrusDig message handlers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CenterWindow();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               int rc;
```

PCNASDLG.CPP 3-24-98 1:11p

// The system calls this to obtain the cursor to display while the user drags
// the minimized vindor.
HCURCOR Chronablg::OnQuenyOragloon() return FALSE; // return TRUE unless you set the focus to a control // It you add a minimise button to your dialog, you will need the code below. // to draw the icon. For MFT applications uniting the document/rise model, // his is automatically done for you by the frameout. Servimessage (MM\_ICCNERASEBNCED, (WPARAM) dc.GetSafeHdc(), 0); mc\_results.SetVindovfext("Vaiting for a name...");
// put ws back at the beginning
GotoDigCxtl(GetDigItem(IDC\_EDIT\_NAVE)); ChaintDC dc(this); // device context for painting // Conter toon in client recturgle in cation - Cethystewhetrics (94\_CXICO); in cylono - Cethystewhetrics (94\_CXICO); one treet; cethystewhetrics (94\_CXICO); one treet; etect.); int x - treet. width() - cation + 1) / 2; int y - (rect. height() - cylon + 1) / 2; void CPcrasDlg::OnSysCcmvand(UDrf ntb, LPARAN 1Paxan) { Wialog::OnSysCommand(nID, 1Param); if ((nID & 0xFFF0) -- IDM\_ABOUTBOX) // Draw the icon dc.Drawfcon(x, y, m\_hfcon); ObourBlg digAbout; digAbout.DoModal (1); Dialog: OnPaint (); return (HCURSOR) m\_hlcon; void CPCnasDlg::OnPaint() { if (Islomic()) el se { -

Page 2 of 3

```
PCNASDLG.CPP 3-24-98 1:11p
                                                                                                                                                                                             // TODD: If this is a RIORDIT control, the control will not
the othis ordification ulusay you overlide the Chialog; indiniblalogi)
// twrtion to send the Pl SETPORPORS message to the control
// with the DM_CORIZE (1ag Offed into the Ibkam mask.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       case nas::NGC_URRATAN:
mcg_str.Format (RES_NC), m_name, "unknown in origin");
icon1 = AfxGetApp() ->LoadIcon(IDI_BLANK);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mc_results.SetWindonText("Waiting for analysis to complete...");
switch (m_nas-analyze(m_name)) {
case nas::NOS_ARABIC:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               mog_str.Pormat(RES_MSG, m_name, "Arabic");
iconl = AfxGetApp() ->LoadIcon(IDI_FLGARABIC);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             case nas::ABC_HISPANIC:
    meg_str.format(RES_MCX, m_name, "Hispanic");
    iconl = AfwGetApp() ->LoadIcon(IDI_FIGSPAIN);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              msg_str.Format(RES_MSG, m_name, "Chinese");
iconi = AlxGetApp()-JcadIcon(IDI_FLGCHIRA);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          count char 'RES_MS' = "The name is appears to be is.";
Carting meg_str;
HIGM iconi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mag_arr.Pounat (*1.1f*, m_nas-sgc_a_score());

nc_resule_arabic_SchirkdovCur (ing_str);

mg_srr.Pount(*1.1f*, m_nas-sgc_c_score());

m_resule_chinese_SchirdovCur (ing_str);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         m._results.SetWindo/Text(msg_str);
mc_results_icon.SetIcon(icon1);
                                                                                                                                                                                                                                                                                                                                                                   mc_nume (GetWindovText (n_name);
n_name :MakeUpper ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  case nas:: NAS_CHINESE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (m_nas->get_status() != 0)
                                                       mc_nume_SetSel(0, 1, FALSE);
word Chenacolly::OnSetfocusEditblame()
                                                                                                                                                      road Chanapig::(ArchangeEditName()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               wid CPctasDig::OnAnalyze()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    about box. Doffodal ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Geoutilly aboutbox;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      void (PenaiDig::OnMout ()
```

mc\_c\_threshold.SetSel(0, -1, FALSE);

void Chanasolg::OnChangeEdit#Threshold()

woid (PenasDig::OnSecfocusEditCThreshold()

cid Genesolg::OnChangeEditAthreshold()

mag\_str. Format (\*\*.18\*, m\_nas-spet\_h\_score()):
nc\_results\_hispanic.SerkindowText (nog\_str);
.// put\_us\_back\_at\_the beginning
GoccolgCtrl (GetDigIten(IDC\_BDIT\_0648));

mc\_a\_threshold.SetSel(0, -1, FALSE);

void CPcnasDlg::OnChangeEditCThreshold()

woid ChemasDig::OnSetfocusEditAffureshold()

mc\_h\_threshold.SetSel(0, -1, FALSE)

CharchDlg batch\_dialog(m\_nas); batch\_dialog.DoModal();

void (PenasOlg::OnBatch()

void (PenasDlg::OnSetfocusEdit#Threshold()

Page 3 of 3

PCNASDLG.H 3-24-98 1:11p

// (last passet Location)

// Hitmosoft Developes Studio will insert editional declarations investingly before the previous line.

#erdif // :defined(MY\_PONOSIG\_#\_09857Ms\_]861\_IDI: 9389\_0000621-0559\_\_ROLIODD\_)

atx\_may void OnSettocusEditHThreshold(); atx\_may void OnBatch(); //}}Arx\_may DETLARE\_MESSAGE\_MAP() 2684

//([in\_periodries])
// microsoft Developer Studio generated include file.
// Used by potai.cc
// Copyright (C) 1999, Language Aralysia Systems

Source: H 3-24-98 1:1

STDAFX\_CPP 3-24-98 1:11p

traction of

// stdatk ttp : source file that includes just the standard includes // pcras, pot vill be the pre-compiled beaker // stdatk.ca) vill contain the pre-compiled type information // copyright (C) 1999, Language Analysis Systems Inc.

sinclude "stdafx.h"

```
//([ARY_INSERT_LOCATION])
// Microsoft Developer Studio will insert additional declarations immediately before the previous line.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ים שמעבאנ<u>ו 1939-2040 פוני 1861 ו 2957-296</u> מנון 2961 אאנוצ איאסור אין האיוויאלול אין אלאביא
                                                         BIT TOCKTOWN STRAKT H. O2857AA9. LAGI, LIDI, 9182 GOOGERUSKO __HICLURED.)
BERTIER ARY, STRAKY, H. O3957AA9. LAGI, LIDI, 9182 GOOGERUSKO.__DICLURED.
                                                                                                                                                                                                                                                                                                                  Whatine VC_ECTMALEAR // Exclude rarely-used stuff from Windows headers
                                                                                                                                                                                                                                                                                                                                                          einclude safavir.ib // PEC core and standard components elinclude safavar. In // PEC extensions if indee APX ID APXCOM SURPORT in include safacom. Ib // PEC support for Windows Common Controls endit // APX_ID_APXCOM_SUPPORT
Capyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                             #1f _MSC_VER >= 1000
Mprogra oxce
#exdif // MSC_VER >= 1000
```

// statis.n : include tile for standard system include tiles.
// or project specific include files that are used frequently. but
// are changed infrequently

STDAFX.H 3-24-98 1:11p

### **PCNASLIB**

```
case DB_ACC_MODE_READ_SHADES: : ios::binary /*| ios::nocreate, filebu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              )
if (!rc in retr_count > 0) {
if (!rc in retr_count > 0) {
// AlswessagaBox(err_cog|EDR12, nume)); // Retrying %s - walting for %
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ) while (if is will energy,count);
if (if is retry,count > 0) {
//if (Arressaysbackerr_megill, name, i * retry_delay / 1000.0), MB_TESAD) ***
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // The input file is was unavailable for ig seconds. Ando you want to t
                                                                                                                                                                                                                                                                                         break;
case ba_ACC_ACCE_READ_SNGEAD :
fa.open(name, ios::in | ios::binary /*| ios::nocreate, fillebu
                                                                                                                                                                                                                                                                                                                                                                                                case DB_ACC MODE READ_MRITE :
fs.open(name, ios.:in | ios.:out | ios.:binary /*| ios::nocre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       case DB_ACC_MODE_READ_WRITE_SREDME :
fs.open(name, ios.:in | ios::out | ios::binary /*| ios::nocre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sleep(retry_delay);
fa.close(); // this close() really is needed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            //break; // from the while loop
// Only attempt to open file stream if it is not opened.
if if(s.impgen()) {
    rc = false;
    while (rc) {
        inr i = 0;
        do do do
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else // all OK or only one try allowed
break; // from the while loop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      fs.read( (char *) thead, sizeof(head) );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (!fs.good()) {
   b_bad = true;
   return EXIT_FAIURE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -> ate, filebuf::sh_nome"/);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 } // while

} // if not open

return rc;

} // reopen_file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      int dbf::get_fleld_info(void)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .> ry the directory again?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (!fs.good()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             dbf_field fld;
                                                                                                                                                                                                                                                                     ** t::sh_none*/);
                                                                                                                                                                                                                                                                                                                                                          : (/.pear_res::) **
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          specouge.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -- ate*/);
                                                                                                                                                                                                                                                                                                                                                                                                                                                 -> ate*/);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (OW)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      dut subt (coust that "tilename, do acc_made_t acc_made, int_retry_count, DMORD retry_delay)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (namel0) -- EXS)
return (alse;
// we are really re-quanting here, this is the first
// we are repairing the code.
// time, but no use repairing the code.
// time, but no use repairing the code.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            bool date:open_tile(count char "fm, int acc_mode, int retry_count, DAMD retry_delay)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D8F.CPP 3-24-98 1:11p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /.....
                                                                                                                             b_bad = :open_file(filename, acc_made, retry_count, retry_delay);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // Store the file name and acc_mode for reopen_file. strncpy(name fn., MAV_DMIH); name_MAV_DMIH = EES; access_maxe = acc_mode;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           basi dbf::reoper_file(int_retry_count, DACMD_retry_delay)
                                Copyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (Llist 1* MAL) delete Llist;
if treclast !* MAL) delete reclast;
if tor strem is open, we should close it.
close_file():
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // if our stream is open, we should close it.
if (fs.is_open())
fs.close();
                                                                               dut.cpp: implementation of the dbt class
                                                                                                                                                                                                                                       spragna werning (disable: 4786)
Adetine USMIRMAX
                                                                                                                                                                      #include "stdafx.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                void ubt::close_file(void)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cool ic . tive;
                                                                                                                                                                                                                                                                                                                                                                                                                                    Metaline CTRL_Z '\032'
                                                                                                                                                                                                                                                                                   finchide clostream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              dit... Tabt (void)
                                                                                                                                                                                                                                                                                                                                               include "dbf.h"
```

.....

```
// skip changes the current record variable and returns the number of // records actually skipped long dat.:skip(long lskip)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // the position_file_pur defaults to false, which means that only // the record namer vill be changed, when the value is true, the // file pointer is modified as wall.
boul doft::go_to( unsigned long lrec, bool position_file_pur)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            int dbf::pos(const char *fname)
{
                                                                                                                                                                                         //}
//carcn (x_alloo) {
pr.setow.mgIEROR.MSG, "Unable to allocate rec_but in vido_c().");
//eart(EXIT_RAIMED);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // seek to start of ourset record fs.seekjorbad.dat_caffet (current_record - 1) * (int)hood.rec_size, is issibel; if (ifs.good())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // read each field record and store it (field offset starts at 1 // in order to skip the deleted flag at the beginning of each record word
                                                                                                                                                                                                                                                                                                                                                      // find out how many fields there are and allocate the filst array f_count = (int) (head data_offset = fs.tellg()) / sizeof(fild); f_list = new dbf_field((unsigned int) f_count);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // jump to the data (should already be there)
// should we check if is.seekg(oi, ios:begin).tellg() == 0?
is.seekg( (long)head.data_oifset, ios::beg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             fldoff = (word)((word)fldoff + (word)fld.length());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // check end of field list delimiter word
if ( fld.name()[0] == 0x0d ) break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      memcpy(&f_list(n], &fld, sizeof(fld));
f_list(n].set_off(fldoff);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for (n * 0, fldoff * 1; n < f_count; n**) {
    fs.read( char *) &fld, sizoof(fld) );</pre>
                                                                                                                                                         tec_buf * new char[head.rec_size + 1];
                                                                                                     /// use record length to allocate rec_buf //try {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (!fs.good()) break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (!fs.good() || b_bad)
    return SXIT_FAILURE;
b_bad • true;
return EXIT_FAILURE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return EXIT_SUCCESS; } // get_field_info
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                current_record • 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return MULL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           chur 'dbf::read_buf(void)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         rec buf * NULL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         b_bad - false;
b_eof - false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 void dbf::setup(void)
{
```

b\_eof \* talse;
if ( current\_record > head.last\_rec) {
 b\_eof \* true;
 current\_record \* head.last\_rec;

else if (current\_record == 0L) current\_record = 1L; return current\_record - oldrec;

unsigned long oldrec . current\_record; current\_record += lskip;

// repeat line from above in order to leave file pointer at start of record file semiglized data\_offset + (current\_record - 1) \* (int)band\_tre\_site, int (ifs\_good)) if (ifs\_good)).

If (ifs\_good)) return NUL;

return rec\_but;

rec\_buf[head.rec\_size] • 806; // terminate de record

// read the record into rec\_buf fa.read(rec\_buf, (int)head.rec\_size); if (ifa.good() || fa.goount() -= 0) return NALL;

Page 2 of 3 tor (int i = 0; i < f\_count; i++)
if (stricmp(frame, f\_list[i].field\_name) == 0)
return i;</pre> return -1;

DBF.CAP 3-24-98 1:11p

return false;

else

else if (0 < lrec && lrec <- head.last\_rec) {

if ( current\_record > head.last\_rec) {
 b\_ecd = true;
 current\_record = head.last\_rec;
 return false;

```
Page 3 of 3
```

```
default : return (word) len_info.mm_size.len; return 0;
                                                                         case 'L':
recurn len info.char_len;
recurn l;
                                                                                                                                                       return 10;
case 'N';
                                                                                                             case 'D':
recum 8;
word dbf_field::length(woid) const
{
                                           switch (fleld_type) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (this-bad) | (fs.godd) •• false) |
return false;
head last_rete:;
if (this-bad) | (fs.godd) •• false) |
if (this-bad) | (fs.godd) •• false) |
if (this-bad) | (fs.godd) •• false) |
if (this-bad) | (fs.godd) •• false) |
return false;
if write (char') Bead, sireof(head) );
if (this-bad) | (fs.godd) •• false) |
return false;
if (this-bad) | (fs.godd) •• false) |
return false;
if (this-bad) | (fs.godd) •• false) |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return (int) f_list[in_pos].length();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  unsigned long dbf::get_last_rec(void) const {
                                                                                                                                                                                                                                                                                                                                                                      if (p < 0)
    return 0; .
return (int)[_list[p].length();</pre>
                                                             int p;
p • positieid);
if (p • 0)
retum 1;
retum (_list(pl_offset!);
                                                                                                                                                                                                                                                                                                                                                                                                                                                            out dot.:leagth(int in pos ) const (
                                                                                                                                                                                                                     return f_list(p).offset();
                               int dbf::offset(const char *field)
{
                                                                                                                                                                                                                                                                                           int dbf::lexyth(const char *field)
                                                                                                                                                                                 int dbf.:offset(int.p.) const
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    unsigned long dbf::recno(void)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      return current_record;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return head.last_rec;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     bool dbf::inc_last_rec(void)
{
                                                                                                                                                                                                                                                                                                                            int p;
p = pos(field);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return time;
```

D8F.CPP 3-24-98 1:11p

```
/* dbf - database class */
class dbf
./
class dbf_field
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protected:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public:
                                                          · public:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       08F.H 3-24-98 1:11p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // Define some standard modes for accessing the database.
// We need a way to make sure that files that are read only // ser expend as read only, otherwise, we will fail to open // per opened as read only, otherwise, we will fail to open // per title if it is on a On-EXT.

on acc much as conder for a On-EXT.

DE ACC TANDE PROD WHITE,

DE ACC TANDE PROD WHITE,

DE ACC TANDE PROD WHITE,

DE ACC TANDE PROD WHITE,

DE ACC TANDE PROD SHREND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /- dbf_field
A field class representing a DBF field record
the damy fields are left in so the class data elements
can be read directly from the file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Copyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       byte dbf_ld;
byte last_update(3);
unsigned long last_rec;
word data offset;
word rec_size;
                                                                                 dof.h: interface for the dof class.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     dummy [20];
                                                                                                                                                                                                                                                                                                        #ifridef word
Exposef unsigned short int word;
                                                                                                                                                                                                                                                                                                                                                                                      Windef byte
typsdef unsigned char byte;
Wendif
                                                                                                                                                                                                                            #if _MSC_VER >= 1000
#px.agma once
#endif // _MSC_VER >= 1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                #/pfine NCMIRMAX
#include <iostream>
#include <fstream>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 finclude evindows.h-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         using namespace std;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       idefine BOS '\0'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               class dbf_header
                                                                                                                                                                  Witnder DB_H
#define DB_H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                private:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public
```

return type() == 'N' ? len\_info.mam\_size.dec : (byte)0;

byte decimals() const

char rame() { return field\_pame; } // it's mill terminated byce type() const { return field\_type; } void set\_off(exor p) { offset\_pos \* p; } void offset() const { return offset\_pos; } void offset() const;

char damy2 $\{14\}_i$  // leave dammy areas so the class // can be read from a DBP file

byte len; byte dec; } ram\_size;

} len\_info;

word offset pos: // NOTE: we will be using part of char damp/1[2]; // this dampy area to hold the field's // offset; was: char damp/1[4];

char field\_name[11]; byte field\_type;

union // the following bytes have two
// different meanings depending
word char les, // on the type of the field
struct nam\_size

int get\_field\_into();
bool open file(orast char 'file, int acc\_mode, int retry\_count, DAGNO retry\_delay);
ropen file(int retry\_count, DAGNO retry\_delay);
void close\_file();

dof\_field \*f\_list; // this should not be public!

char name (\_MAX\_PATH + 1);

int f\_count; void setup();

b\_bad; b\_eof; access\_mode;

fstream fs; dbf\_header head; char \*rec\_buf;

// info about the current record unsigned long current\_record; bool deleted;

```
bool go_to(unsigned lang tree, bool position_file_ptr * FALSE);
                                                                                                                                                                                                   virtual that 'read but(); // read current record into rec_but
                                                                                                                                      bool bad() const ( return !fs.good() || b_bad: )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   int get_f_count() const { return f_count; }
                                                                                                 char *get_file_name() { return name; }
                                                                                                                                                                     bool do_eof() const { return b_eof; }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               void flush() { (void) fs.flush(); }
                                                              unsigned long get_last_rec() const;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      int length(const char *field);
int length(int position) const;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        int offset(const char *field); int offset(int position) const;
                                                                                                                                                                                                                                                                        (void) read buf();
return rec_buf;
                                                                                                                                                                                                                                        virtual char *db_read()
                                                                                                                                                                                                                                                                                                                                                                                                                   int pos(const char *);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 unsigned long rechol);
                                                                                                                                                                                                                                                                                                                                                long skip(long • 15);
```

protected: bool inclust\_rec();

```
'/
int nas::init(const language lang,
int nas::init(const language lang,
const chur 'ng finame, const char 'di_g finame, const char 'tti_g_finame,
const char 'ng_finame, const char 'di_g_finame, const char 'tti_g_finame)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    input: a language type and the names of the digraph and trigraph files.
Output: a stem (o) infinites all wore with non-zero inficies specific error conditions.
Values in the trees indicate errors in the name tables; values in the treeties inficies errors in the name tables; values in the treeties inficies errors in the trigraph tables, values in the Univies indicate errors in the trigraph tables. See also: 95c. Security.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    rc • load names(n_g_fname, g_which);
if (rc • • 0)

// Load name tables
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             nas::deletekkam=TableData(name_table_t *aTabl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                { // Load name tables
name_table_t *g_which, *s_which;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      deleteklameTableData(£m_hispanic_s_names)
                                                                                                                                                                                                                                                                                                                                                                                              delecekameTableData (m_arabic_a_names);
delecekameTableData (m_chinese_a_names)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (rc == 0) { // Load digraph tables
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              name_table_t::iterator it;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /* intr
Read in a language database.
'----are type and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                int rc = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              biov –
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Nus.mas(court language language).

court clar mg.frame1, court clar 'di.g.frame1, const char 'sti.g frame1, court char 's_frame1, court char 'di.g.frame1, court char 's_frame1,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     m_a_j_threshold = 45.0;
m_a_j_threshold = 45.0;
m_c_j_threshold = 45.0;
m_c_j_threshold = 42.0;
m_c_j_threshold = 42.0;
m_p_j_threshold = 45.0;
m_p_j_threshold = 45.0;
m_p_j_threshold = 45.0;
m_p_j_threshold = 45.0;
m_j_threshold = 45.0;
m_j_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // These thresholds were nade up rather camually, and should probably be // looked at more carefully. Dan't forget that these interact with the // adjustment values (+/-100.0) used in the analyze() function.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAS.CPP 3-24-98 1:11p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Adjusted by EFB on 2/4/98 as per linguist specifications
                                                                                                                                                                                                                                                                                Summer 1997: Pitairt Drabek - ported from original Clipper code
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              static char 'str_alltrim(char 'str_out, const char 'str_in);
Copyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   See the uncertace (.h) file for general information
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ras.cpp. inplementation of the mas class.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          witder DEBUS
mender THIS FILE
static char THIS FILE];
Metine new DEBUS JRM
Wentif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               eprugna warning (disable: 4786)
edetine ICMIRMX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Winclude "scdafx.h" // Winclude "pcmas.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           #include <use_ansi.h>
#include <map>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tone ameriace std:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      #include "dbf.h"
#include "nus.h"
```

() Bas:: 'nas()

Page 1 of 6

return 11; break;

default:

g which • &m\_chinese\_g\_names.s\_which • &m\_chinese\_s\_names

CASE NOS CHINESE:

g which • im\_arabic\_g\_names; s\_which • im\_arabic\_s\_names;

switch (lang) {
 case RAS\_ARABIC:

```
( // Calculate the trigraph scores (using only the first and last trigraphs).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (!:able_lit) {
    These values must come from the way the statistics were gathered)
    // These values must come from the way the statistics were gathered)
    // The files are created properly.
    // The files are created properly.
    double t_os = -2001.0, t_as = 100.0;
    double t_os = -2001.0, t_bs = -100.0;
    double t_os = -2001.0, t_bs = -100.0;
}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /* analyze
Corput: Seturns a guess of the language type.
Input: A terminated character array. Leading and trailing blanks will be removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                use_names (m_arabic_g_names, m_name, m_a_score);
If (thoub_hith) use_names (m_arabic_g_names, m_name, m_c_score);
If (thoub_hith) use_names (m_athrese_g_names, m_name, m_c_score);
If (thoub_hith) use_names (m_athrese_g_names, m_name, m_c_score);
If (thoub_hith) use_names (m_athranic_g_names, m_name, m_c_score);
If (thoub_hith) use_names (m_athranic_g_names, m_name, m_name, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_names, m_nam
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // Before getting into the n-gram counting, see if the name // has already been defined in one of the tables. // No name should be in more than one table! name table E::iterator it; bool table_hit * table;
                                                                                                                                                                                                                                                                                                                                                                                                          const nas::language nas::analyze(const char *in_name)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ( // Calculate the digraph scores.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           n_name[0] = '#';

er_alltrim(m_name + 1, in_name);

etrcat(m_name, "#");
m_a_score = 0.0;
m_c_score = 0.0;
m_h_score = 0.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         rr = load_trigraphe(lang, tri_g_fname, g_which);
} // Load trigraph tables
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         rc - load_digraphs(lang, di_g_tname, g_which);
if (rc = 0)
rc - load_digraphs(lang, di_g_tname, s_which);
// Load_digraph tables
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g_which * &m_hispanic_g_trigraphs;
g_which * &m_hispanic_s_trigraphs;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g_which • 6m_chinese_g_trigraphs;
g_which • 6m_chinese_g_trigraphs;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g_which - em_hispanic_g_digraphs;
s_which - em_hispanic_s_digraphs;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                rc = load_trigraphs(lang, tri_g_fname, g_which);
if (rc == 0)
                                                                                                                                                                                                                                                                                                                                   g_which - 4m_chinese_g_digraphs;
s_which - 4m_chinese_s_digraphs;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g_which . 4m_arabic_g_trigraphs;
s_which . 4m_arabic_s_trigraphs;
                                                                                                                              g_which • sm_arabic_g_digraphs;
s_which • sm_arabic_s_digraphs;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (rc == 0) { // Load trigraph tables
    trigraph_table_t *g_which, *s_which;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // Two macros to make life easier in the next routine Wdefine use names(t, n, s) \ { \
digraph table c '9 which, 's which;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return 21;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CASE NAS_HISPANIC:
                                                                                                                                                                                                                                                                                                                                                                                                                                                            CASE NAS_KISPANIC:
                                                                                                                                                                                                                                                                                                CASE ING CHINESE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            case NAS_CHINESE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       switch (lang), (
case MAS_ARABIC:
                                                                                     default:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               }
#Actine use_ngrams(t, d, s) \
{ \
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | // init
```

Page 2 of 6

NAS.CPP 3-24-98 1:11p

p = m\_name; tri\_str = (\*p << 16) + ((\*(p + 1)) << 8) + \*(p + 2);

size\_r name\_len; if ((name\_lan; if ((name\_lan; strich(m\_name)) >= 4) { // The M. M. and two actual letters DAXBO tri\_str;

trigraph\_table\_t::iterator it;

use joyrane (n\_arabic\_g digraphs, w, r\_sd);
use\_jrynene (n\_statel.g\_digraphs, w, r\_sd);
use\_jrynene (n\_dinese\_g\_digraphs, w, r\_cg);
use\_jrynene (n\_dinese\_g\_digraphs, w, r\_cd);
use\_jrynene (n\_dispanic\_g\_digraphs, w, r\_jd);
use\_jrynene (n\_dispanic\_g\_digraphs, w, r\_jd);

```
counts n;

con signize with the significant signize with the signize with the signize with the signize with the significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant significant si
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           //\ I wish people had simply chosen the same name for corresponding fields. switch (lang) \{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // Load digraph tables
int nas::load_digraphs(const language lang,
const char 'frame, digraph_table_t 'Which)
                                                                                                                              // be nasty about people changing the tables
if (field_off1 < 0)</pre>
int field_off2 = table.offset(field_name2);
int field_len2 = table.length(field_name2);
                                                                                                                                                                                                        field_namel = "DI";
field_name2 = "ALSCORE";
break;
case NOS_CHIRGSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              field_name1 = "DIGRAFH";
field_name2 = "CISCORE";
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       field_name1 = "DIGRAPH";
field_name2 = "HISCORE";
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             case 105 HISPANIC:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          double n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        int rc = 0;
const int FLD2 MID = 8;
char *field_name1;
char *field_name2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                case NAS_ARABIC:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      recum rc;
// load_names
                                                                                                                                                                                                                                                                                                                                                  p = m_i name + name_i len + 3;

tri_etr = (*p < 16) + (*(p + 1)) << 0) + *(p + 2);
                                                                                                                         use, syram (a. chinese g. trigorphi, tri, etc. (...g))
use, syram (a. chinese g. trigorphi, tri, etc. (...g))
use, syram (a. chinese g. trigorphi, tri, etc. (...g))
use, syram (a. hispanic, g. trigorphi, tri, etc. (...gi))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ume_nyrame (m_arable_g_trigraphs, tri_gtr, t_me);
ume_nyrame (m_arable_g_trigraphs, tri_gtr, t_me);
ume_nyrame (m_arable_g_trigraphs, tri_gtr, t_me);
ume_nyrame (m_arable_g_trigraphs, tri_gtr, t_me);
ume_nyrame (m_arable_g_trigraphs, tri_gtr, t_me);
ume_nyrame (m_arable_g_trigraphs, tri_gtr, t_me);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               || But that is ambiguous since there are several interbolds. So, do
|| furth to largest interbolds, then see if that is over its intershold!
|| or do find those which are over their own thresholds, then take the
|| largest of those? The former is being used right now,
|| with only home larguester, this entrol is just time, but if men
|| larguests are added, this portion of code will have to be recritten.
|| Larguages are added, this portion of code will have to be recritten.
|| if (a_a_score > m_a_g_threshold || m_a_score > m_a_s_threshold |
|| if m_a_score > m_c_g_threshold || m_a_score > m_h_score)
|
| If m_a_score > m_c_g_threshold || m_a_score > m_h_score)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (m.h.score >* m.hg.threshold || m.h.score >* m.hg.threshold)
if m.h.score >* m.a.score * m.a.score
rc * 165_HISPANIC;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else if (m_c_score >= m_cq_threshold || m_c_score >= m_cs_threshold)
66 m_c_score >= m_a_score 66 m_c_score >= m_h_score)
10 = (Wa_G|H|ESE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // Choose the largest score which is over the threshold
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // Load name tables
inc nas::load_names(const char 'fname, name_table_t 'which)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rc * 0;
int field_off1 * table.offset(field_name1);
int field_len1 * table.length(field_name1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              rc = 12; // a nume table was not accessibly else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         dbf cable (fname, DB_ACC_MODE_READ, 0, 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  m_a_score = _MAX(t_ag, t_as);
m_c_score = _MAX(t_cg, t_cs);
m_h_score = _MAX(t_hg, t_hs);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 const char 'field_name! * 'BAE';
const char 'field_name? * 'SCORE';
const int FLD2_MID * 8;
int rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           language ic . MS_URREMN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                name_table_t::iterator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return rc:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 // aralyze
```

table.skip();

streat(s1, "#");
strmcpy(s2, but + field\_off2, field\_len2);

MAS.CPP 3-24-98 1:11p

÷.

```
| Debth of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the contro
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      const int mas::batch_testing(const char *fin_name, const char *fout_name, const char *field_name)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Page 4 of 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // be nasty about people changing the tables
if (field_off1 < 0)</pre>
                                                                                                                                                                                                                                                                                                                             rc • 0;
int feld_off; = table_offset(field_name1);
int feld_len; = table_length(field_name1);
int field_len; = table_offset(field_name2);
int field_leng = table_offset(field_name2);
int field_leng = table_length(field_name2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        static char but(BUTSIZ);
static const char 'lang_names[] - {
   *Arabic', 'Ohinese', 'Hispanic', 'Uhbrown'
                                                                                                                                                 rc = 12; // a table was roc accessible else (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rr - 15.
else if (freld_enz := FLD2_WID)
else {
                                                    obf cable (frame, DB_ACC_MODE_READ, 0, 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 rc = 13;
else if (field_off2 < 0)
rc = 34;
else if (field_lenl != 3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1f (get_status() := 0)
return 81;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return rc:
} // load_trigraphs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  char ss(FD2) w(D + 1);
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switch (lamp) {
case NS_ANANC:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MAS.CPP 3-24-98 1:11p
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inc mas::load_crigraphs(conc. language lang,
conc. chur 'frame, trigraph_cable_t 'which)
                                                                                                                                                              rc • 0;

int field_cff1 • table.offset(field_nowm1);

int field_cff2 • table.offset(field_nowm1);

int field_cff2 • table.offset(field_nowm2);

int field_cff2 • table.length(field_nowm2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // be masty about people changing the tables
if (field_off1 < 0).</pre>
if (table.bd()) rc + 22; // a table was not accessible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       field name1 - "TRIGRAPH";
field name2 - "ASCORE";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    field_name1 = "TRIGRAPH";
field_name2 = "CSCORE";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   rc = 25;
else if (field_len2 := FLD2_NID)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               rc = 23;
else if (field_off2 < 0)
rc = 24;
else if (field_len1 != 2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           break;
case NAS_HISPANIC:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            int rc = 0;
const int FLD2_MID = 8;
char *field_name1;
char *field_name2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   case NAS_CHINESE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // load_digraphs
                                                                                                                else {
```

field\_name1 = "TRICRAFH"; field\_name2 = "HSCORE"; break;

return 31; break;

dbf table(frame, DB\_ACC\_MOB\_READ, 0, 0);

```
// The sactract 1 is no problem here eince we've already checked for the 
// eppy strings bove.
for (tail = (char *)ext.lo. etrilen(ext.lo) - 1; head < tail is isspece(*tail); tail--)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Uthoron larguage in name-table initialization",
"/ Uthoron to open file in mame-table initialization",
"/ Incorrect name field offset in name-table initialization",
"/ Incorrect name field length in name-table initialization",
"/ Incorrect threshold field offset in name-table initialization",
"/ incorrect threshold field offset in name-table initialization",
"/ incorrect threshold field offset in name-table initialization."
                                                                               /* capy the in-err to the out-err */
emmone(err_out, head, (size_t) (tail - head + 11);
err_out[tail - head + 1] = 805;
err_ant[tail - head + 1] - 105;
} /* err_alltrim */
                                                                                                                                                                                                                                                                                                                                                                                                                                                   name-table errors
                                                                                                                                                                                                                                                                                                                                                                        lanyase lang * analyze(sl);
fprint(f_out, '+-, 's %s 10, 212 $10.21f $10.21f\n',
tb.190e_S1Z2, 100_S0G_S1Z2, sl, lang_names(lang);
%a_soute, m_c_soute, m_scoute,
                                                                                                                                                                                                                                                                              while (fgets(buf, BRSIZ, f_in) := NUL) {
    buf(sets(buf) -1) = BS; // eliminate NB/LNE character
    buf(sets(buf) -1) = BS; // in case we read in a too-long name
    st_alltrim(m), buf);
                                                                                        // Find the end of the string, then move backwards to the last non-blank.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MAS.CPP 3-24-98 1:11p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // Pind the first non-blank
for (head * str_in; *head !* BOS && isspace(*head); head**)
             Punction to trim leading and trailing blanks from a string.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // if we are left with nowhing, chop off the blaster by // secting the beginning of the string to BDS.

if (thend. = BDS) [A, Ob work on output string for str_out[0] = BDS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     static char *str_alltrim(char *str_out, const char *str_in)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // make sure the source atring is not empty
// if so, set the result atring to empty, unless
// if it is MALL,
if ('sut_in = MDS) {
    return str_out;
    return str_out;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // make sure there is a source string.
if (str_in == NULL)
    return NULL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                )
fclose(f_out);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      const char *head;
char *tail;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          . . . . . . . . . . . . . . /
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        )
fclase(f_in);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return 0;
} // batch_testing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               / str_alltrım
```

. .

Page 5 of 6

```
if (0 <* mog code it mog code < sizeof error_meg / sizeof error_meg (0)) return error_meg (mog_code);
const cluar 'mas::get_massage(const int msg_code) const {
                                                                                                                            return "Unknown message code";
                                                                                                       e136
```

/\* 48 /\* '10 SICH DEGG\*.
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NAS.CPP 3-24-98 1:11p

Cupyright (C) 1998, Language Analysis Systems Inc.

has.h: interface for the mas class.

Summer 1997: Robert Drabek - ported from the original Clipper code.

This file defines the nat (None-Analysis System) class, whose goal is to ubstrikt a name asyment for internal blusts allocad as belonging to one of a limited set of language types the set currently consists of a classic, Chinese, and Hispanic momes. Wene for which the confidence level is low for all of these categories is identified as "unknown."

The classification algorithm is based upon statistical analysis of dingal and circipal forgameries of broom names. But a set of tubbes of well-broom names is examined for names before the counting phase, and the score will be taken from these tables when so found. A name must only apprain in one table. The scores for the other languages will be assigned apprain in one table. The scores for the other languages will be assigned.

## 2. Interface:

The class constitution is to be given the names of the name, digraph and eligipath databases (100 files). The spet\_status() meather function should then be checked immediately for a seto (0) value which would indicate satisfactory infeltiation; now exero values would indicate specific reasons for failure. The function get\_message() will return a string representation of the failure, if desired.

After construction, a name (a properly terminated character array) is appeal to the analyze() series function, which returns one of the "language" enamented types. Analyze() also testing the internal values of the calculated scores for each language group, and these are accessible through the

get\_a\_score(), get\_c\_score() and get\_h\_score() member functions. Damining these values could yield more detailed information for further classification.

Besides having the highest accré, the returned name category must also pass a threshold specific to each name category. These values can be per\_aj\_threshold(), ser\_cg\_threshold(), ser\_ny\_threshold(), ser\_ag\_threshold(), ser\_eg\_threshold(), ser\_ag\_threshold(), ser\_ny\_threshold(), ser\_ny\_threshold(), ser\_ny\_threshold(), ser\_ny\_threshold(), ser\_ny\_threshold(), ser\_ny\_threshold(), and ger\_ny\_threshold(), and ger\_ny\_threshold(), ser\_ny\_threshold(), et and gotten through the

The following times are probably the minimum required in the calling module in order to use this header file:

#include <use\_ansi.h> #include <use\_ansi.h> #include <map>

#pragna warning(disable: 4786) using namespace std;

The DBF files are read using the dbf class defined elsewhere. The relevant contents are then stored into private SIL map (name\_table\_t, digraph\_table\_t and trigraph\_table\_t) data menters. The init() menter

MAS.H 3-24-98 1:11p

# function is where all of this work is accomplished.

The keys for the maps are atther a char pointer (char 1), an unsigned explore quantity (a kED) or an unsigned forta-byte aquantity (a bED) is the charge of the charge of the charge of the best of the charge of th

# 4. Tables (external files)

For each language there are three types of tables, NAWS, DIGANH, and CALCANH, and CALCANH, and CALCANH, and the seat type three is one for given have and one for surmers heres, a total of it tables. The shaking conventions should be clear from these exemple Arabic cables:

ASSMET.REF. ACTOL LEF. ANTIL LEF.

ASSMET.REF. ASSMET.REF. ASTRILLER

The column names in the digraph and trigraph were unfortunately not well tosen when the original dipper program was built, but we are retaining then here for backeria compatibility.

N.B. Currently (Summer 1997) the given-name digraph and trigraph
 capability is disabled since the tables themselves have not yet been
 built.

Witndet NAS H

#if MSC\_VER >= 1000

#endif // \_MSC\_VER >= 1000

Added by ETB so that the code can compile on its own as a library Note that this means that NSS vill (as currently set up), only consider the liter 16 obars of a name when doing classification. Obarges in this value might also require charges in the length of the associated DSF (iller, since their length currently is 16.

#define NAS\_NAMB\_SIZE

class nas

enum language { NAS\_ARABIC \* 0, NAS\_CHINESE, NAS\_HISPANIC, NAS\_UNDIONN }; public:

private:

typedef char name t(NAS\_NAME\_SIZE + 2 + 1); // 2 chars for # and #

// copy of name currently being analyzed name\_t m\_name; // scores being calculated

double m\_s score;

double m\_h\_score,

// threshold against which to compare scores double m.g. Threshold, m.g. threshold, double m.g. threshold, double m.g. threshold, m.g. threshold, m.g. threshold, m.b. threshold, m.b. threshold, m.b. threshold, m.b. threshold, m.b. threshold, m.b. threshold, m.b. tratus of the analysis--zero means all OK int m\_status;

// needed for char\* comparisons in the name maps templatecclass \_Ty> Page 1 of 2

```
::
```

typodef may crar ' double, less structure' > > name\_table\_t;
mere\_table\_t on\_table\_to\_nemes;
nere\_table\_t o\_chinese o\_nemes;
nere\_table\_t o\_chinese o\_nemes;
nere\_table\_t o\_nemes o\_nemes;
nere\_table\_t o\_nemes o\_nemes;
nere\_table\_t o\_nemes o\_nemes;
nere\_table\_t o\_nemes o\_nemes;
nere\_table\_t o\_nemes o\_nemes; typedef map< DWMED, double > trigraph\_table\_t; :/pockef map< WORD, double > digraph\_table\_t; iigraph\_table\_t m\_arabic\_g\_digraphs; trigraph\_table\_t m\_arable\_g\_trigraphu; trigraph\_table\_t\_m\_chreae\_g\_trigraphu; trigraph\_table\_t\_m\_theyanic\_g\_trigraphu; trigraph\_table\_t\_m\_table\_t\_m\_table\_t trigraph\_table\_t\_m\_table\_t\_m\_table\_t\_m\_table\_t trigraph\_table\_t\_m\_tabl digraph\_cable\_e = \_\_arable\_g\_digraphs;
digraph\_cable\_e = \_\_dubrachs;
digraph\_cable\_e = \_\_dubrachs;
digraph\_cable\_e = \_\_dubrachs;
digraph\_cable\_e = \_\_dubrachs;
digraph\_cable\_e = \_\_dubrachs;
digraph\_cable\_e = \_\_dubrachs;
digraph\_cable\_e = \_\_dubrachs;
digraph\_cable\_e = \_\_dubrachs;
digraph\_cable\_e = \_\_dubrachs;

int initicomi language ladj.
comit char 'ig\_frame, count char 'itig\_frame, count char 'itig\_frame, count char 'ifig\_frame, count char 'ifig\_frame, count char 'ifig\_frame):

int load\_names(const that 'frame, name\_table\_t 'which);
int load\_digraphu(const language lang,
const that 'frame, digraph\_table\_t 'which);
int load\_trigraphs(const language lang,
const char 'frame, trigraph\_table\_t 'which);

nas::delecetameTableData(name\_table\_t \*aTable);

public:

// Zero (0) indicates all is well; non-zeros indicate applications.

// Walves in the teems indicate errors in the name tabling

// Walves in the twentes indicate errors in the digraphicables. .,

Alvaloss in the thirties indicate errors in the trigraph tables.

const int ger\_giatus); const [ return m\_giatus; } cont tarquage languaget, cost clust 'di\_g\_famen, const char 'tri\_g\_fnamen, const char 'n\_g\_fnamen, const char 'n\_g\_fnamen, const char 'tri\_g\_fnamen, const languages, const languages, languages, const char 'n\_g\_fnamen); cont language analyze(cont char \*);
cont int batch\_testing(cont char \*, const char \*);
cont chur 'get\_message(cont int) cont; () seu

NAS.H; 3-24-98 1:11p const double ger\_a\_score() const { return m\_a\_score; } const double get\_c\_score() const double get\_c\_score; }

# const double get h score() const { return m h score; }

COMPANY OF THE PROPERTY OF THE	Correspond   m - A correspond   m - Correspond
void set_cq_threshold(const_double_in_threshold) { m_cq_threshold • in_threshold;	threshold) { m og threshold - in threshold; }
<pre>void set_hg_threshold(const_double in_threshold) { m</pre>	_threshold) { m_hg_threshold • in_threshold; }
void set_as_threshold(const_double in_threshold) { m	_threshold: { a_as_threshold - in_threshold: }
void set_cs_threshold(const double in_threshold) { m	_threshold) { m_cs_threshold - in_threshold; }
void set he threshold (const double in threshold) ( m hs threshold . in threshold;	_threshold) { m_hs_threshold • in_threshold; }
const double get_ag_threshold() const { return m_ag_threshold; }	{ return m_ag_threshold; }
const double get_og_threshold() const ( return a og !	{ return a og threshold; }
const double get he threshold() const { return a he (	{ return a hg_threshold; }
const double get_as_threshold() const { return m_as_threshold;	{ return m as threshold; }
const double get_cs_threshold() const { return m_cs_threshold;	( return m cs_threshold; }
const double get_ha_threshold() const { return a_ha_threshold;	{ return a hs_threshold; }
	-
#endit // JNS_H	
	, , , , , , , , , , , , , , , , , , , ,

Page 2 of 2

### **TDSLIB**

```
const int Opprox.:plain_edit_distance(const unsigned char 'variant const unsigned char 'variant float sacore)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // use this to read in a file containing rec codes and their // associated distance scores const bool Opprox::set_rec_distances(const_dar_tilename)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                x = buf(0);
y = buf(2);
n_fd_float_matrix(x)[y] = n;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  float Opprox::get_plain_score()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPROX.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      byce n = atoi(buf + 4);
if (*(buf + 1) == BLANK & *(buf + 3) == BLANK & n >= 0)
n_fd_watrix(static_castchyte>(buf(0)) {static_castchyte>(buf(2))} = n;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // first, set exact notches // first, set exact notches // the are 15 features and the file has the number of feature differences // nuttiplied by 10 for fil = 0; i < 156; i++) nuttiplied by 10 for (i = 0; i < 156; i++) n_d for (i = 0; i < 156; i++) n_d for (i = 0; i < 156; i++) n_d for the contribution is = 1 ? 0 : (15 - 1) * 10);
                                                                                                                                                                                                                                                               int i, j:
char buf[BUFSIZ]; // BUFSIZ is apparently defined in <etdio.h>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     const bool Opprox::set_float_distances(const char *fname)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // now get the feature distances from the given file while (f_in.getline(buf, BUFSIZ))
                                                                                                                                                                                                                                                                                                                                                         // read a file of feature differences
const bool Opprox::set_distances(const char *fname)
                                                                                                                                 Without DeBid
warder This File
static char This_File()...File_:
Weetine now DEBIG_NEW
Heralic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   char *p = strchr(buf, ',');
if (p != NALL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        'p = EOS;
if (strlen(buf) == 7)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  unsigned int x,y;
ifstream f_in(fname);
if (!f_in.good())
return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                ifstreum f_in(fname);
if (!f_in.good())
return false;
                                                                                          tpis exected std:
Winclude "stdafx.h"
Winclude «fstream»
                                             linclude "approx.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           f_in.close();
return true;
```

infile.close(); return true;

//int i.j;
//char buf[BUFSIZ]; // BUFSIZ is apparently defined in «stdio.h»

ifstream infile(filename);
if (finfile.good())
return false;

f\_in.close(); return true;

// first, set exact matches
// there are 15 features and the file has the number of feature differences int i, j; unsigned char buf(BUFSIZ); // BUFSIZ is apparently defined in cardlo.ho

INTERPRETABLEMENTAL PROPERTY OF THE CONTROLLEMENT O

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// approx.cpp: implementation of the approx class.

// mitigited by 10 for (1 • 0; 1 × 256; 1++) a\_c(d\_c(1000\_matrix(i) (j) • (i • j ? 0.0 : 1.0); a\_c(d\_c(1000\_matrix(i) (j) • (i • j ? 0.0 : 1.0);

float n = atof( (corst char\*)bif + 4);
if (\*(buf + 1) == HLANK && \*(buf + 3) == HLANK && n >= 0)

while(f\_in.getline( (char\*)buf, BUFSI2))

return 1.0 - m diff / static\_cast<float>(\_max(m\_stri\_len, m\_stri\_len)); Page 1 of 6

int rc = plain\_diff(query, variant); score = get\_plain\_score(); return rc;

```
int n: - threshold <- 0 ? exact_diff(str1, str2) : approx_diff(str1, str2); score - get_score(); return rc;
                                                                                                                                               / approg_diff
This is the classic edit-distance algorithm, the V.I. Levenshtein (or P. Sellers) variant.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // Pick the Lowest score from the rules
// • · · upper left
Lowest = u diff_array[p_x - 1] [r_x + 1] • (char_eq[p_char, r_char] ? e
// • · co the left
// • of the left
// • chary[p_x] [r_x - 1] • 1;
if (d + Lowest | Lowest = d;
                                                                                                                                                                                                                                                               // wee this werson was the values in the m_td metrix to dreck
// with those waters had
// with those waters had
// with those waters had
count int Opprive: approx_diff(count unisped dar setz)
count int Opprive: approx_diff(count unisped dar setz)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d = m \underbrace{diff\_array[p\_x - 2]}_{\cite{A}} [t\_x - 2] + d1 + d2 + 1; if (d < lowest)
                                                                                                                                                                                                                                                                                                                                                                                            unsigned char p_char = MIL; int d = 0; int d = 0; int d = 0; int d = 0; int d = 0; int d = 0; int d = 0; int d = 0; int d = 0; int t d = 0; int t d = 0; int t c = 0; // atting indexes int p_x = 0; int c_x = 0; // difference-array indexes int lowest = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for (pi • 0; (p_char • strl[pi]) !• BOS; pi++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d1 = char_eq(str1[pi - 1], str2[ti]) ? 0 : 1;
d2 = char_eq(str1[pi], str2[ti - 1]) ? 0 : 1;
if (d1 == 0 && d2 == 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for (ti = 0; (t_char = str2(ti)) != 50S; ti++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // -- above
d - m_diff_array[p_x - 1] [t_x] + 1;
if (d < lowest lowest = d;
// -- transment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         m_diff_array[p_x][t_x] * lowest;
}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        m_strl_len * pi;
m_strl_len * ti;
m_diff * get_difference();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (pi >= 1 G& cd >= 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return m_diff;
                                                                                                                                                                                                                                                                                            p_x + pr + 1;
c_x = it + 1;
c_x = it + 1;
for the lowest accors from the rules

// - - upper left
lowest = a_if_i = a_ray(p_x - 1) (c_x + 1) + (plain_char_eqip_char, c_char; ? 0 : 11;
- - to the left
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /- differences
One of the above will be selected based on the desired maximum feature-
distance threshold-exact does a quick string compare instead of a more
expensive calculation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  di - plain char equeri[pi - 1], str2[ci]) ? 0 : 1;
d2 - plain_char_eq[str1[pi], str2[ti - 1]) ? 0 : 1;
if [d1 - 0 & & d2 - 0]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d * m_diff_array[p_x - 2| (t_x - 2| + dt + d2 + 1; if (d < lowest) lowest + d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               const int Opprox::differences(commt unsigned char *strl,
unsigned that p_i that * NRIL;
unsigned that t_i that * NRIL;
int d = 0; int d = 0; int d = 0;
int p_i = 0; int t_i = 0; // string indexes
int p_i = 0; int t_i = 0; // difference attry indexes
int [next = 0].
                                                                                                                                                                                            for (pi • 0; (p_char • str1(pi)) :• BOS; pi•• )
                                                                                                                                                                                                                                            for (t.) = 0; (t_char = str2(til) != EOS; tive )
                                                                                                                                                                                                                                                                                                                                                                                                                                            d - m_diff_array(p_x)(t_x - 1) + 1;
if (d < lowest | lowest = d;
// -- above</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      d = m_diff_array(p_x + 1|f_x| + 1;
if (d < lobest) lowest = d;
// -- transposition
if (pi >= 1 &= ti >= 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               m_diff_array(p_x)(t_x) = lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         m_strl_len * pi;
m_strl_len * ti;
m_diff * get_plain_diff();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               return m_diff;
```

const unsigned char \*str2, const int threshold, double Geore)

count int Ouprox::plain\_diff(const unsigned char \*strl, const unsigned char \*str2)

Page 2 of 6

APPROX.CPP 3-24-98 11:24a

```
for (pi = 0; (p_char * arr1[pi]) |= BOS; pi++) // BOS is defined as '\0'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Page 3 of 6
d = m_diff_float_array[p_x - 2] [t_x - 2] + di + d2 + 1;
if [d < lowest]
lowest = d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // this version uses REC3 rather than IPNs
// this version uses the new float mentral
const int CApprox.rec_differences front unsigned char 'reckray',
const unsigned char 'reckray',
float recComparay(156) [156],
chulle &core)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      int rc * approx_rec_diff(reckray), reckray2, recCompArray); score * get_rec_score(); return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            coust int Opprox::approx_rec_diff(const unsigned dar *arz),
const unsigned dar *arz,
float diff_matrix(256)[256))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for (ti = 0; (t_dhar = arr2[ti]) != BOS; ti++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             и . . .
пополнительний пополний пополний пополний пополний пополний пополний пополний пополний пополний пополний пополн
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               return m_float_diff; //.this is the number of differences } // approx_diff
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             int d=0; int d_1=0; int d_2=0;
int p_1=0; int t_1=0; // etrug indexes
int p_2=0; int t_1=x=0; // difference-array indexes
int lower = 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       f_out << m_diff_float_array(i)[j] << '\t\t';
                                                                                                                                                                                                                                                                      m_diff_float_array(p_x|(t_x) = lowest
                                                                                                                                                                                                                                                                                                                                                                                                                         m_strl_len = pi;
m_strl_len = ti;
m_float_diff = get_float_difference();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for (int j = 0; j < NAME_SIZE; j++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /*
ofstream f_out("dump.txt");
for (int i = 0; i < NOME_SIZE; i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  unsigned char p_char = NUL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 f_out << '\n';
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          f_out.close();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // -- upper left 
lowest * m_i diff_float_array(p_x + 1) {r_x + 1} + char_float_eq( (unsigned int) p_char, (unsigned int) r_cha
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPROX.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           d1 * char_float_eq( (unsigned int)str1(pi - 1), (unsigned int)str2(ti));
d2 * char_float_eq( (unsigned int)str1(pi), (unsigned int)str2(ti - 1));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // this waisten is used for generating the rec comparisons access
// it meds to call a different version of the score function
count float Outprox.see_gen_float_differentee(over unsigned char 'seri),
float_dispersion over the second float 'seri).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // note this version uses the values in the m.fd matrix const float Okprox::approx_float_diff(const unsigned char *strl).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            count that Okprox: that_differences(const unsigned char *stri,
const unsigned char *stri,
float &score)
                                                                      танинининининининининининининини
                                                                                                                                                                                                                                                                            инининининининининининининининини
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          unsigned clor \rho_{\rm c}char • MIL; unsigned chor \rho_{\rm c}char • MIL; unsigned chor \epsilon_{\rm c} days • MILL; float d • 0.0; float d • 0.0; float d • 0.0; float d • 0.0; inc \mu_{\rm c} • 0; in \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; in \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} \epsilon_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; \mu_{\rm c} • 0; 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for (pi * 0; (p_char * str1(pi)) != BOS; pi++ )
                                                                                                                                                                                                                                                                                                                                     // value using implementation
// these functions handle character comparison using
// the feature values as the actual vales returned
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for (ti * 0; (t_char * str2(ti)) !* BOS; ti++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               d * m_diff_float_array(p_X - 1) (t_X) + 1;
if (d < lowest) lowest + d;
// -- transposition
if (pi >* 1 ff ti >* 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d * m_diff_float_array[p_x] (t_x - 1] + 1;
if (d < lowest) lowest * d;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      p.x = pt + 1;

t.x = tt + 1;

// Pick the lowest score from the rules

// -- upper left
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       float rc - approx_float_diff(strl, strl);
score - get_rec_gen_float_score();
return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  float ic - approx_float_diff(strl, str2);
score - get_float_score();
return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // ·· to the left
```

1f (d1 - 0.0 44 d2 - 0.0)

// approx\_duff

```
// this is the float version of the above function (yes I know about overloading)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for (pi = 0; (p_char = arri{pi}) := EDS; pi++) // EDS is defined as '\0'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             coust float Opprox..rec_float_differences (const unsigned char 'reckrayl, const unsigned char 'reckrayl, loat recomparray(256) [256], float recomparray(256) [256], float secone)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        const float Opprox:approx_rec_float_diff(const unsigned char *arr),
const unsigned char *arr2,
float_diff_mstrix[256] [256])
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       float re * approx rec_float_diff(rechray), rechray2, recCompArray);
score * get_rec_float_scoref);
return rc;
                                                                                                                                                                                                                                                d = rec_eq(arri[pi - 1], arr2[ti], diff_matrix) ? 0 : 1;
d2 = rec_eq(arri[pi], arr2[ti - 1], diff_matrix) ? 0 : 1;
if (d1 == 0 & d2 == 0)
                               if (d < lowest) lowest = d;

// - above

d = a_rec_diff_array(p_x| (t_x - 1) + 1;

// - above

d = a_rec_diff_array(p_x - 1) (t_x| + 1;

if (d < lowest) lowest = d;
                                                                                                                                                                                                                                                                                                                                                                            d = m \underline{\ rec.} \ diff \underline{\ array} \{p\_x + 2\} \{f\_x + 2\} + d1 + d2 + 1; if \{d < lovest\}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for (ti = 0; (t_char = arr2[ti]) != BOS; ti++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             панинининининининининининининин
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              unsigned on r , char = MML; little d = 0.0, int pi = 0, little d = 0.0, int pi = 0, little d = 0.0, // string indexes int pi = 0, little t = 0, // string indexes int px = 0, o, nr e, v = 0, // difference-array indexes flowt lowers = 0.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      m_rec_diff_array(p_x)(t_x) = lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     t_x - ti + 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          m_strl_len * pi;
m_strl_len * ti;
m_rec_diff * get_rec_difference();
recum m_rec_diff;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         unsigned char p_char • NULL;
                                                                                                                                                                         // -- transposition
if (pi >= 1 at ti >= 1)
          // -- to the left
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             p_x = pi + 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             lowest * m_rec_diff_array(p_x - 1)(t_x - 1) + (rec_eq(p_char, t_char, diff_matrix) ? 0
                                                                                                                           lowest . m_rec_diff_array[p_x - 1] [t_x - 1] + (rec_eq(p_char, t_char, diff_matrix) ? 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for (pi + 0; (p_chur + arr1{pi}) != 80S; pi++) // 80S is defined as \frac{1}{2}\0'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          coust int Oupprox.rrec_differences (coust unsigned char 'reckray',
coust unsigned char 'reckray',
coust unsigned char recomparize(1256),
double score)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          count int Okprox::approx_tec_diff(count unsigned char *arr, count int Okprox:approx_tec_diff(count unsigned char *arr, cont unsigned char *arr, [256] [256])
                                                                                                                                                                                                                                                                                                                                                                                                                                 d1 = rec_eq(arr[pi - 1], arr2[ti], diff_matrix() ? 0 : 1;
d2 = rec_eq(arr[pi], arr2[ti - 1], diff_matrix() ? 0 : 1;
[f (d1 == 0 & d2 & d2 == 0)]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       d * m_{\tt Lec\_diff\_array(p_X * 2) (f_X * 2) * di * d2 * 1;} if (d < lower)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             int ic - appior_rec_diff(reckriay), reckray2, recCompArray);
score - get_rec_score();
return fc;
                                                                                                                                                                  d = m_rec_diff_array[p_x] [t_x = 1] + 1;

1f (d < lowest) lowest = 4;

1// - abrive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tor (ti * 0; (t_char = arr2(ti)) !* BOS; ti++)
                                                                                                                                                                                                                                                                                                 d = m_rec_diff_array(p_A - 1)(t_x) + 1;
if (d < lowest) lowest = d;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // string indexes
// difference-array indexes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E_{x,x} = G_{x} + G_{y} // Pick the lowest score from the rules // -- upper left
              c_{-N+1} \in \mathcal{U}_{+}  ) plot the lowest score from the rules // . Upper left
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     lowest - d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   m_rec_diff_array(p_x|[t_x] = lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    unsigned char p_char, t_char;
int d, di, d2;
int pi, ti; // string indexes
int p.x, t_x; // difference-arra;
int lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           m_strl_len * pi;
m_strl_len * ti;
m_tec_diff * get_tec_difference();
return m_rec_diff;
                                                                                                                                                                                                                                                                                                                                                                 // -- transposition if (pi -- 1 && ti >= 1)
P_x · pi · t.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          p_x + pi + 1;
```

APPROX.CPP 3-24-98 11:24a

4 01 0

```
m_diff. 0;

coret unsigned char *p;

coret unsigned char *p;

for (p - strl, q - strl); *p |- 305 is *q |- 305; p**, q**)

if (char_gelp, *q!)

m_diff.*;

if (p, - 305) // see which is longer, then add the length differential

addit(- - strlent(const char*)q);

alse
                                                                                                                                                           di = rec_float_eq(arr1[pi - 1], arr2[ti], diff_matrix] ? 0 : 1;
di = rec_float_eq(arr1[pi], arr2[ti - 1], diff_matrix] ? 0 : 1;
if (di == 0.0 &i di == 0.0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // this is only used when the threshold of the original implementation
// is set to 0
const int CApprox::exact_diff(const unsigned char 'str1,
const unsigned char 'str2)
                                                                                                                                                                                                                                            d+n_rec_diff_float_array(p_x - 2) (t_x - 2) + d1 + d2 + 1; if (d < lowest)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for (pi = 0; pi <= m.strl_len; pi <> ) {
   if (pi >= 1) f_out << strl[pi - 1] << ": "; else f_out << " ";</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ининининининининининининининининини
// ... above
d = u_rec_diff_flost_array(p,x - 1) [t,x] + 1;
d = u_rec_diff_flost_array(p,x - 1) [t,x] + 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return false;

f_out << strl << " " << strl << endl << endl;

f_out << " " ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        m_strl_len = pi;
m_strl_len = ti;
m_rec_float_diff = ger_rec_float_difference();
recum m_rec_float_diff;
                                                                                                                                                                                                                                                                                                                                                                                          m_rec_diff_float_array(p_x)(t_x) . lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   m_diff -= strlen((const char*)p);
return m_diff;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ofstream f_out("x.out", los::app);
if (!f_out.good())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           byte *CApprox::get_fd_matrix()
                                                                             // -- transposition
if (pl >= 1 && ti >= 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return &m_fd_matrix[0][0];
                                                          lowest . m_rec_diff_float_array[p_x - 1] [t_x - 1] + rec_float_eq(p_char, t_char, diff_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             lowest . m_rec_diff_float_array(p_x . 1| (t_x - 1) . rec_float_eq(p_char, t_char, diff_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     //
cust fluit Opprox..rec_fluit_differences(const unsigned char 'rechray),
const unsigned char 'rechray.'
const unsigned char rechraptaray/156| [356],
floit &some)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        coust that Opprox.:aprox_rec_that_diff(cost wasged char *art), cont wasged obs *art), cont wasged obs *art), cont wasged char diff_matrix(356) (256))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPROX.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for (pi = 0; (p_char = arr1{pi}) != 50S; pi++) // 50S is defined as '\0'
                                                                                                                                                                                                                                                                                                                                                d1 = teg_flost_eq(errl[pi - 1], err2[ti], diff_matrix) ? 0 : 1;
d2 = teg_flost_eq(errl[pi], err2[ti - 1], diff_matrix) ? 0 : 1;
if (d1 == 0.0 if d2 == 0.0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          float rc * approx_rec_float_diff(recArray), recArray), recCompArray);
score * get_rec_float_score();
return rc;
                                                                                             d = m_rec_diff_float_array(p_x + 2) (t_x + 2) + d1 + d2 + 1; if (d < lowest)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \label{eq:def:def} d + m \  \, \text{rec_diff\_licar\_array[p\_x][f\_x + 1]} + 1; if (d < lowest) lowest = d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for (ti = 0; (t_char = arr2(ti)) != BOS; ti++)
                                                                                                                                                                                           // -- airne
d - m_rec_diff_fleer_array[p_x - 1][f_x] + 1;
if (d < lowest) lowest - d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // string indexes
// difference-array indexes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                m_arri_len - pi:
m_arri_len - ti:
m_rec_tlouc_diff - ger_rec_tlout_difference();
recurn m_rec_tlouc_diff;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         m_rec_diff_float_array(p_x)[t_x] . lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C_{X^{**}} ci • 1;

// Pick the lowest score from the rules

// -- upper left
      // Pick the lowest score from the rules // ... upper left
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             unwigned char p_char, t_char;
float d, dl;
int pi, ti; // string indexes
int p_x, t_x; // difference-arr;
float lowest;
                                                                                                                                                                                                                                                                      // ·· transposition
if (pi ·· 1 && ti ·· 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .. matrix);
// -- to the left
                                                                                             •• matrixli:
// ·· to the left
```

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APPROX.CPP 3-24-98 11:24a
```

for everti,

for (p. 0) pi congett, len piv) {
 for (p. 0) pi congett, len piv) {
 for (it) of it congett, len piv) {
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for (t1 + 0) t1 <= m\_str2\_len; t1++) {
out\_atr.Format(192d \*, m\_diff\_atray[p1] [t1]);
f\_out << LPGSTR(out\_atr);

f\_out << end);

```
stred (startFt. . * ');
concountFt. * startFt.;
while (reconsumtPt. : '\0') {
    concountFt. : '\0') {
    concountFt. : '\0') {
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *startPtr * ANGLO_CONSCIENTS;
*consonantPtrl;
*consonantPtrl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                *startPtr = AKELO_CONSONANTS;
*consonantPtrl;
*consonantPtrl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // append a space to the consonants string so we include the // space character in our pairs statcher - new chalfatter(NATLO_CONSONATS) a 2); stropy(starther, NATLO_CONSONATS);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // append a space to the comenants string so we include the // space character in our pairs scarefor. new charlesten(MACLO_CONSCANTS) + 2); stringy(startPet, -- ML)_CONSCANTS);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for (i = 0; i < 255; i-+) {
    tor (j = 0; j < 255; )++)
    consourableHeadMaray(I) (j), intt = 0;
    consourapsieBironMaray(I) (j), int = 0;
    consourapsieBironMaray(I) (j), int = 0;
    consourapsieBironMaray(I) (j), int = 0;
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    consourapsieBironMaray(I) (j), int = 0;
    consourapsieBironMaray(I) (j), int = 0;
    consourapsieBironMaray(I) (j), int = 0;
    consourapsieBironMaray(I) (j), int = 0;
    consourapsieBironM
                                                                                                                                                                                                                                                                                                             for (i = 0, i < 255; i++) {
    for (j = 0; j < 255; j++)
        consonantpair@itvalArray(i) [j] = 0;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    bitValForInt1 = 1;
bitValForInt2 = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              bitval = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       consonantPtr2++;
bitVal <<* 1;
if (bitVal == 0)
bitVal = 1;</pre>
initOmschantBitvalArray()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     consonantPtr1++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "diphoneinit.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       )
delete [] startPtr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               unsigned
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -> - bicVal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              piox ~
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       To use this function, you must first call the inicomsonantBitvalArray function somewhere in your code. It needs to be called just once.
                                                                                                                                                                                                                                                                                     The value is created by walking through the string, and looking at each character separately. Buth character is support to a particular bit within the 32 bit value.
                                                                                                                          haction to transform a UCV string (a string of IPA consonants) into a 32 bit value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  More that this method of encoting is limited because we loose information about the number of occurances of each character, since we only get one bit for each character.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           while (constraint for 1- '\0') (constraint for the '\0') (constraint for the '\0')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      bool quirator . (const bits_64_t abl, const bits_64_t ab2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 bool quetator.(const bits_64_t &bl., const bits_64_t &b2)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // unsigned int consonantBitvalAcray[255];
// unsigned int consonantpairBitvalAcray[255][255];
bits_6i_t consonantpairBitvalAcray[255][255];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  bitVal - 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            unsigned int diff * bl.intl + b2.intl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                unsigned int diff . bl.intl - b2.intl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for (i = 0; i < 255; i++)
consonantBitvalArray(i) = 0;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (diff == 0)

diff == bl.inc2 · b2.int2;
return diff < 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           initConsonantBitvalArray()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "stdufx.h"
"bitmapizeUCV.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       consonantPtr++;
bitVal <<= 1;
```

BITMAP 1.CPP 3-24-98 11:24a

unsigned

Page 1 of 2

. Capyright (C) 1998, Language Analysis Systems Inc.

#include

:::

```
// next. loop through the pairs while (*componentPer is "\0)" | componentPer is "\0)" | consonentPer is "\0)" | consonentPer is "\0)" |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // lastly, do the last character followed by a space retVal |* conscnantpainBitvalArray[[unsigned char]*(conscnantPr - 1)][' '];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               while (consonantRr != '\0') {
    retVal |- consonantRrsy((unsigned char)*consonantRr;);
    consonantRr*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /*
unsigned int bitmapizeUCV(const char *ucv)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 retVal • 0;
*consonantPtr • ucv;
                                                                                                                                                                                                                                                                                                                            consonancer:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    return retval;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return retVal;
                                                                                                                                                                                                                                                                     . . 101;
// next, loop through the pairs
while ('consonantPer != '\0') {
    bitSignature[0] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    bitSignature[1] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    bitSignature[1] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    bitSignature[1] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    bitSignature[1] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    bitSignature[1] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    bitSignature[1] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    bitSignature[1] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    bitSignature[1] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    bitSignature[1] |= consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    consonantPer][(unsigned char)*(con-
    consonantpairBitvalArray[(unsigned char)*consonantPer][(unsigned char)*(con-
    con-
                                                                                                                                                                                                                                                                                                                          consonantpairBitvalArray{(unsigned char)*consonantPtrl}{(unsigned char)*consonantPtr2}
                                                                                                                                                                                                                                                                                                                                                                                                                                                            // one or the orber bittval should be 0, since the entire 64 bit value should
// have only 1 bit turned on.
if (bittvalPorint2 -= 0) {
    bitvalPorint2 -= 0) {
        int was ease end of first 32 bits, set the second 32 bits to 1 and
        // start shifting that
        if (bitvalPorint1 -= 0)
        bitvalPorint2 -= 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // lattly, do the last character followed by a space bitsignature(0) |- consonantpairs(tvalbrray((unsigned char)*(consonantPer - 1))|| '').intl; bitsignature(1) |- consonantpairs(tvalbrray((unsigned char)*(consonantPer - 1))|| '').intl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // first do.the leading space with the first character.
hitSignacure[0] * consonantpairBitralAray(' ') [(unsigned char)*consonantPtr].intl:
hitSignature[1] * consonantpairBitralAray(' ') [(unsigned char)*consonantPtr].intl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           bitmupizeUCV(const char *ucv, unsigned int *bitSignature, int numbytesInSignature)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            retVal • 0;
•consonantPtr • ucv;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           )
consonantPtrl++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        )
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return retVal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   }
delete () startPtr:
*/
                                                                                                                                                                                                                                                                           . intl • bitValForIntl:
                                                                                                                                                                                                                                                                                                                                                                             .. int2 - bitValForInt2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // int
```

retval - consonerinationitivalArray(' ') ((unsigned char) cons

BITMAP-1,CPP 3-24-98 11:24a

first do the leading space with the first character.

retVal = 0; \*consonantPtr = uc7;

int const char

/\* unsigned int bitmapizeUCV(const char \*ucv)

```
\rho cycle c ... regular expression searching using the shortest substring model
```

McMetine RE\_CUP\_MAX 255 Whetine FAST\_MATCH 2048 Whetine INDVT\_BUFFER\_SIZE 1048576

#define todigit(c) ((c) - '0')

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## IN WARRAIT!

catchet.hs catchib.hs catchio.hs catche.hs catchip.hs

"stdafx.h" #include #include ginclude #include

typedef struct (
int Actual Contents\_Are\_Private; cgrep\_machine;

int Actual Contents Are Private; cypacket struct (

\*cgrep\_environment;

#define COREP\_DRAY 0
#define COREP\_ERROR\_LAMBDA 1
#define COREP\_ERROR\_STATAX 2

#detine CINEP\_MILLEN ((cgrep\_environment) 0)

#Jetine GIREP\_FAST\_MATCH\_RECOMENDED 256

CGREP.CPP 3-24-98 11:24a

Page 1 of 13

```
typodef enn ctypebun (
alma alpia, aerit, blank, criti, digit, graph, lower, print, punct, space, upper, adigit, remedibubove
upper, adigit, remedibuse
                                                                                                                                                                                                                                                                                                    Adding SPRBOL_STRAT (SPRBOLS + 0)
Adding SPRBOL_SD (SPRBOLS + 1)
Adding SPRBOL_SD (SPRBOLS + 1)
Adding SPRBOL_SD (SPRBOLS + 1)
Adding SPRBOL_SD (SPRBOLS + 1)
Adding SPRBOL_SD (SPRBOLS + 1)
Adding SPRBOL_SD (SPRBOLS + 5)
Adding SPRBOL_SD (SPRBOLS + 5)
Adding SPRBOL_SD (SPRBOLS + 5)
The types symbol and supersymbol must both be unsigned, offset must be a signed type, state must be an unsigned type. A variable of type supersymbol must be able to hold any valid value of symbol plus the ablictional values defined following.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       machineType type;
transition (*trPastTable)(SYMMOL_SIGMA);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              position 'psTable;
transition 'trTable;
transition trSigma, trStart, trEnd;
state maxState;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            struct environmentStructure 'next;
unsigned char 'name, 'body;
int nparms;
} 'environment;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       typedef struct transitionStructure (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               struct transitionStructure 'next;
superSymbol sy;
state st0, st1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ypedef struct environmentStructure
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                typeaef struct positionStructure {
    struct positionStructure 'next;
    state st;
    offset of;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                typedef struct machineStructure {
                                                                                                                                 typedef unsigned char symbol;
typedef unsigned supersymbol;
typedef long offset;
typedef unsigned state;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    position ps;
offset supN, u, v, of;
*machine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #define FDGL (*(state)0)
                                                                                                                                                                                                                                                                            Idefine SYMBOLS 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | machineType;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             } *transition;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                position;
```

```
freeTransition = (struct transitionStructure *)MALLOC (aBunch'sizeof (struct transitionStructure));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (tree)ransition == (transition) 0) {
    if (manfransitionAllocations < MA_TRANSITION_ALLOCATIONS)
    static unsigned abanch = A_RANCH;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            freeTransition
? (((tr) * freeTransition), freeTransition * freeTransition->next)
: ((tr) * allocateTransition ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for (i = 0, tr = freeTransition; i < (aBunch - 1); i++, tr++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AlchessageBox("Could nor allocate memory");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    #define DISPOSE_TRANSITION(tr) (void)\
((tr)->next = freeTransition, freeTransition = (tr))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              static transition trStatic = (transition) 0; static transition savedTransition = (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if ((prr = malloc (n)) == (void *) 0) .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tr * freeTransicion;
freeTransition * freeTransition*>next
                                        static wold · local#blloc (size_t n) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  transition tt, unsigned int 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tr-ynext = (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       #define NEW_TRANSITION(tr) (void)\
                                                                                                                                                                                                                                                                                                                                                                     return (void *) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         static transition
allocateTransition (void)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aBunch ees 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   exit (1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    return pcr;
                                                                                                                                                                                                                                                                                                                            if (n -- 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return tr;
                                                                                                                                                                                                                 void *ptr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      unsigned that "expr, int compilerlag, environment env, int nputms,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   static int
static transition transitional Continue (No. 700)
static transition from transition (transition) 0.
static function from transition (stansition) 0.
static int
static int
static contraction (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) (stansition) 
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static transition trAhion (transition trX);
static transition trAhion (transition trAhy);
static transition trAhion (transition traffe, transition trAhyth);
static transition release (transition trX, unsigned chouse)pps);
static transition erebareabcached (unsigned chouse)pps);
static transition erebareabcached (transition trAhon);
static transition erebareabcached (transition trAhon);
static transition erepareabcached (transition trAhon);
static transition erepareabcached (transition trAhon);
static transition erepareabcached (transition trAhon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 static tensition erdifiyatol (apprifyatol 87, int compilefug);
static int emperatebulatud (unsigned dara-reapt, unsigned 191);
static transition erebrated (unsigned char-reapt, int compilefug, environment env);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           static int erebarseBrucketBracket (unsigned char "oxpr. unbigned match(), int tick); static transition trsymbol (superSymbol 97):
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      unsigned char **expr, int compileflag, environment env, int uparms
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static environment evokaturi (environment evok dat 'name, int mpairms);
catic environment evokaturi (environment evokaturi);
catic environment evokaturi (environment evokaturi);
catic environment evokaturi (environment);
catic environment evokaturi (environment);
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                castic char
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ctype (''atina" - almah', ("atina", alpua), ("accii", accii], ("blank", blank),
("anter", cmit], ("digir", "digit", "graph", graph), ("borer", blank),
("print", print, ("purc", purct), ("spae", apoel), ("upper", upper),
("adigit", adigit), ((char ') 0, nonoCithekbove)
                                                                                                                                                                                                                                                                                                                                                                                                                    // Now many cines can we increase the pool of available transitions alletine WAX_TRANSITION_MALGORITOS 10 Hebrine A_BERCH 12
static transition exchapact (transition tx);
transition frobace (transition txX);
static transition forth (transition txX);
static transition exfort (transition txX);
static transition exfortsement (transition txX, unsigned N);
static transition exchanged (transition txX, unsigned N);
static transition exchanged and transition txX, unsigned N);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           );
scatte transition (CCOpy (transition t.X);
spatic transition trMupp (transition t.A, transition t.B);
static transition erebaracoperation (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         transition parms
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gratic transition ereParse (
                                                                                                                                                                                                                                                                                    Robetine TRUE 1
Robetine FALSE 0
```

// save a pointer to what was just allocated so we can free it later transitionAllocations[numfransition] \* freeTransition;

next time, allocate twice as many

nuffransitionAllocations++;

AtchessageBox("Too many transition allocations. Exiting");

exit (0):

else (

Page 2 of 13

CGREP.CPP 3-24-98 11:24a

```
static transition
tiConcaterate (transition trieft, transition trilght)
                                                                                                                                        trunution ir, trResuli, trBxtra = (transition) 0;
int lumpimheeded = 0;
static struct transitionStructure trokayStructure; static transition trokay * &trokayStructure;
                                                                                                                                                                                                                it (tribit .. trOkay || trRight .. trOkay)
return trOkay;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tur (tr • trExtra; tr; tr • tr->next)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      it (tirkight->sy -- SYMBOL LAMBDA)
                                                                                                                                                                                                                                                                       if (tileft ** (transition) 0)
if (trRight ** (transition) 0;
return (transition) 0;
else
                                                                                                                                                                                                                                                                                                                                                                            tecum trRight;
else if (trRight == (transition) 0)
recum trLeft;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       lambiakeeded * 1;
tr = trRight;
trRight = trRight-smat;
DISPOSE_TRANSITION (tr);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      it (trieft->sy ** SWBOL_LAMBLA)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        trExtra - trCopy (trRight);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tr • trleft;
trleft • trleft->next;
Dispose_TRANSITION (tr);
```

if (trExtra)
trResult = trMerge (trExtra, trResult);

trResult - trHerge (trieft, trRight);

tor (tr \* trRight; tr; tr • tr->next) rr-sgt0 \*\* trLeft-sgt0 \* 1; it (tr-sgt1 !\* FRBAL) tr-sgt1 \*\* trLeft-sgt0 \* 1; tr \* trRight; trRight \* trRight-wext; OISTOSE\_TRANSITION (tr); trExtra \* trOopy (trLeft);

it (lambdaNeesled)
trExtra = tTMsrge (trExtra, trCopy (trLett));

else it (trRight->sy -- SYMBOL LAMENA)

if (tr->st0 !\* 0)
 tr-st0 \*\* trleft->st0 \* 1;
if (tr->st1 !\* fital)
 tr->st1 \*\* trleft->st0 \* 1;

for (tr = triatt; tr; tr = tr>fext)
if (tr>stl == FIRD.)
tr>stl = triatt>st0 + 1;

CGREP.CPR 3-24-98 11:24a

static transition tiMergy (transition trA, transition trB) transition tr = (transition) 0, \*trp \* £tr; transition tr . (transition) 0, "trp = 4tr; if (trA == trOkay || trB == trOkay)
return trOkay; if (tch.sco > tch.sco)
afinct = 1;
else if (tch.sco < tch.scb.sco)
afinct = 0;
else if (tch.sco > tch.sct)
afinct = 1;
else if (tch.sco > tch.sco)
afinct = 0;
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afi HEM\_TRANSITION (tru); tr0-set = tr0-set; tr0-set = trX-set; tr0-set = trX-set; (trp) = tr0; trp = kr0-shext; trp = kr0-shext; NEW\_TRANSITION (tr); tr-sey = STMEOL\_LAMEDA; tr-snext = trResult; trResult = tr; for (,trX; trX = trX->next) static transition
trCopy (transition trX) transition tr0; int afirst, transition trO; if (trX •• trOkay) return trOkay; while (trA 44 trB) if (lambdaNeeded) return trResult; return tr;

Page 3 of 13

trBranch - trOncaterate (trBranch, trClosure (trAtom, c)); trAtom - (transition) 0;

else ERE PARSE DIE (); break;

case '(': if (trAccm) trhtm - erefereaboud (equr. compileflag, trhtum);
if (trhtm - transition) 0;
ERE\_PARSE\_DIR ();
trhtm - trichereabe (trhtmach, trhtum);
trhtum - (transition) 0;

eise ERE\_PARSE\_DIE (); break;

for (c \* \*\*expr; c !\* '\0' 44 c !\* ')' 44 c !\* ','; c \* \*\*\*expr)
svitch (c)
{

case '|: case 'g':
tfileach' - tricozeneste (tribranch, trikton);
tribran, - (transition) 0;
tribrant - ereParsoperation (tribrant, tribranch, op);
tribrant - ereParsoperation);
terum (transition) 0;
tribranch - (transition) 0;
tribranch - (transition) 0;

transition trResult - (transition) 0; transition trBranch - (transition) 0, trAton - (transition) 0; uniqued char op - ' '

unsigned that \*\*expr, int compileFlag, transition \*parms

while (0) static transition ereParse (

trfree (trflesult); \
trfree (trfleanch); \
return trfree (trflem);

tt0 = tr8; .tr8 = tr8-mext, DISFOSE\_TRANSITION (tr0); afirst = 1;

f (aFirst)

CGREP.CPP 3-24-98 11:24a

Page 4 of 13

case '(';
trBranch = trConcaterate (trBranch, trAtcom)

case '(!)

tribunch = tribuncatenate (trBranch, trAton);

crAton = transition) 0;

if (\*\*\*\*expr =\*\*\*\*/V)

Exp. Pass (1)

trAton = testree (expr. compile?) e.p. ev., rparre, parre);

if (trAton == ternsition) 0 || \*\*\*expr (\*\*\*\*);

break;

```
titleram - erebrisablender (ext. compiletia) env. rpana, paral;

if (tetam - erebrisablender (ext. compiletia);

brew;

case '::

case '::

case '::

case '::

case '::

case '::

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tr = trk; trk = trk-mext; DISPOSE\_TRANSITION (tr);

return trX;

while (tzX) { transition tr:

if (trK == trOkay) return (transition) 0;

CGREP.CPP 3-24-98 11:24a

static transition trPree (transition trX)
{

f cransition tribing (transition trieft, transition trieght)

framilion tr, tribealt;

int landaheabed = 0;

if (trieft == tribay) || tribight == tribay)

return tribage == (transition) 0;

else

return (transition) 0;

else

return (tribight == (transition) 0)

return (tribight == (transition) 0)

return (tribight == (transition) 0)

return (tribight == (tribight)

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trResult - trCompact (trReduce (trCompact (trSort (trResult))));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            trilosure (transition trX, unsigned char closureType) trClosure (transition trX, unsigned closureType)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (trX ** trOkay || crX ** (transition) 0)
return trOkay;
                                                                                                                                                 NDW_TRANSITION (trResult);
trResult-setc = (transition) 0;
trResult-set1 = FDRAL;
trResult-set1 = FDRAL;
trResult-sey = SYMEGL_INVALD;
                                                                                                                  if (triesult .. (transition) 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tr = trX;
trX = trX->next;
Dispose_TRANSITION (tr);
lambdaNeeded = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              transition tr. trO, trResult;
int lambdaNeeded;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (trX->sy == SYMBOL_LAMBDA)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else if (closureType != '+')
lambdaNeeded = 1;
                                                                                                                                                                                                                                                                                                                         NEW_TRANSITION (LL);
tr-ssy = SYMBOL_LAMEDA;
Lr-ynext = trResult;
trResult = tr;
                                      (*trp) = (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else
lambdaNeeded = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (closureType ** '?')
trResult * trX;
                                                                                                                                                                                                                                                                                     if (lambdaNeeded)
                                                                                                                                                                                                                                                                                                                                                                                                                                       return trResult;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        static transition
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGREP.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tro-ssy ** tri-ssy || tro-ssy ** SYMBOL_SIGM || tri-ssy ** SYMBOL_SIGM
static transition trintersect (transition trieft, transition trilight)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for (tr0 * trleft; tr0; tr0 * tr0->next)
for (tr1 * trRight; tr1; tr1 * tr1->next)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             state st0 = tr0->st0*adjust + tr1->st0; state st1;
                                                                                                           if (tileft ** trOkay || trRight ** trOkay)
return trOkay;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else
Sci = CrO->Sci'adjust • Cri->Sti;
                                        transition tr. trO, tr1, trResult, *trp;
int lambdableeded;
                                                                                                                                                                                                                                                    return trRight,
else if (trRight -- (transition) 0)
return trLeft;
                                                                                                                                                                     it (trieft == (transition) 0)
if (trRight == (transition) 0)
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        it (craight say .. SMBOL_LAMBOA)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else
if (tri->stl ** FIMOL)
continua;
                                                                                                                                                                                                                                                                                                                       if (trieft-sey ** SYMBOL_LAWEDA)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (tro-set) == FINAL)
if (tri-set) == FINAL)
stl = FINAL;
                                                                                                                                                                                                                                                                                                                                                             lamblakeskel = 1;
tr = trieft;
trieft = trieft-stext;
DISPOSE_TRANSITION (tr);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tr = trRight;
trRight = trRight->maxt;
DISPOSE_TRANSITION (tr);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           adjust - trRight->st0 + 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NEW_TRANSITION (tr);
tr->st0 * st0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               olse
lambdakeeded = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else
lambdalkeded = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      continue;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     trp - ftrResult;
```

Page 6 of 13 NEW\_TRANSITION (trO); trO-next = (transition) 0; trO-sey = tr>sey; trO-setO = tr>setO;

transition trRestart \* (transition) 0, \*trpRestart \* £trRestart;

for (tr = teX; tr; tr = tr=>next)
if (tr->stl == PDML)
{

```
static transition erbargeSnocket (
unsigned clar "eage, int compileRieg, environment env. int rpaima transition "parma
                                                                                                                                                                                                                                                                                                                                                                                                                           if (upper)
trResult = trConcatenate (trResult, trClosure# (trAtom, upper));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           unsigned i; int matchStart, matchStartLine, matchStartLine, matchBrdLine; int tick = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (**eptr == '0')
return ereParseBracketk (expr, compileFlag, erv, rparms, parms):
                                                                                                                                                                                                                                                                                                                                                trResult * trOomcatemateN (trOopy (trAtom), lower); upper -* lower;
    for (; isdigit (c); c = ****equ')
if ((upper * 10*upper * todigit(c)) > Bg_URP_sex)
                                                                                                                                        1f (c := :): || upper < lower || upper -= 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if ("expr =='\''')
{
    tick = 0;
    if ("\'expr == \\0')
    return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tor (i. 0; i. SWBOLE; i..)
match[i] - !tick;
matchStarr - !tick;
matchStartine - !tick;
matchStartine - !tick;
matchStartine - !tick;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              else
trFree (trAtom);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (****expr == '\0')
return (transition) 0;
                                                 { trPres (trAkcm); return (transition) 0;
                                                                                                                                                                           trPree (trAtom);
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return trResult;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return trokay,
                                                                                                                                                                                                                                                  if (compileFlag)
                                                                                                                                                                                                                                                                                                                 if (lower)
                                                                                                                                                                                                                                                                                                                                                            static transition erebarosband lumniqued char **expr. int compileriag, transition trakon)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CGREP.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (lower)
trheault - trConcatenated (trCopy(trkcom), lower);
trheault - trConcatenate (trResult, trClosure (takcom, ***));
return trResult;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tor (; isdigit (c), c * ****expr)
it ((lower * 10*lower * todigit(c)) > RE_DUP_MXX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else if (compileFlag)
return trConcatenateN (trAtom, lower);
                                                                                         trResult = trMerge (trX, trRestart);
                                                                                                                                                                                                                                                                                                                                                                                                                  unsigned lower • 0, upper • 0;
unsigned c • ••••expr;
transition tr@esult • (transition) 0;
trO-sil = 0;
*trpRestart = trO;
:trpRestart = itrO-smext;
                                                                                                                                                                                     NEW_TRANSITION (tr);
tr.ssy = Smedi_LaweDA;
tr.snext = trResult;
trResult = tr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if ((c = '****expr) == '}')
if (compileflag)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     trFree (trAtom);
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    trfree (trAtcm);
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          trFree (trAtcm);
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 trFree (trAtcm);
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (c :- ';')
if (c -- '}')
if (lower -- 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    else
return trokay;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else
return trökuy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (!isdigit (c))
                                                                                                                                                      it (lamidatheded)
                                                                                                                                                                                                                                                                                                        return triesuit;
```

```
static int ereParseBackslash (unsigned char "expr, unsigned *cX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   static transition ereTrSymbol (superSymbol sy, int compileFlag)
                                                                                                                                                                                                                                                                                                                                                                                                                                          if (matchStartLine)
    tr = trUnion (tr, trS/mtol (StMROL_START LDES));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (matchDrdLine)
tr * trthicn (tr, trSymbol_EPO_LINE));
                                                                                                                                                        if (matchStart)
tr = trUnion (tr, trSymbol (SPMBOL_START));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           case T:

c = 'AT';
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cse '1t';
c = 'AC';
break;
cse 'V';
c = 'VV';
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                                                                                                                                                                                                                                                                                              if (matchEnd)
    tr = trUnion (tr, trSymbol (SNBOL_BD));
if (match[i])
tr = trUhion (tr, trSymbol (i));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (compileFlag)
return trSymbol (sy);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Switch (c . ...expr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else
return trokay;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return trokay;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    recurn tr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  case '\0';

return 1;

case '\1';

case '\1';

case '\1';

case '\1';

break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     case 'n':
c = '\n';
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     unsigned c;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (erePareuBracketBracket (expr. (unsigned int *)match, tick))
return (transition) 0;
                                                                                                             if (c .. '\\' & ereParseBackslash (expr, &c))
    'return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            it (ereTextFlagMorMaround)
matchStartLine = match['\n'];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (d < c || ****expr == '\0')
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      transition tr • (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (****expr == '\0')
    return (transition) 0;
if (**expr != '|')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (ereTextFlagMorkAround)
match['\n'] * tick;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else
matchStartline • tick;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (ereTextPlagMorkAround)
astch['\n'] = tick;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tor (i = 0; i < S'080LS; i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | clear if (c == 'c') | matchinar = tick; | clear if (c == 's') | matchinar = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = tick; | clear = 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else
matchErdLine - tick;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         unsigned d . **expr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for (; c <= d; c++)
match[c] = tick;
                                                                                                                                                                                                                                                                if (****expr ** '\0')
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     match(c| = tick;
match('.') = tick;
                  unsigned c ∗ ••expr:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               mutch[c] • tick:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (c -- '$')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (c ** '-')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /
while (**expr !* ')');
                                                                                                                                                                                                                                                                                                                                                                                                            (.). •• 5) 31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (compileflag)
```

Page 8 of 13

CGREP\_CPP 3-24-98 11:24a

```
matte transition erobasedt (unsigned char "expr. int compileFlag, environment envi\{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        scfranslate . (state *) alloca((maxState * 1)'sizeof (state));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               return ereParse (sbody, 1, env->next, -1, (transition *) 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if ((env = envGeatch (env, name, 0)) == (environment) 0) return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         transition tr, tr0, "trp;
state maxState, prevState, "stp, "stTranslate;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              it (tex ** trOkay || trX ** (transition) 0) return trX;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     static transition trCompact (transition trX) {
                                                                                                                                                it (izadigit ((*expr)(1)))
c - 16*c - toadigit (***expr);
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              musicate = 0;
previitate = trX->st0;
for (tr = trX->rext; tr; tr = tr->rext)
if (tr->st0 != previitate)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          actranslate;
prevState = ttx>sto = 1;
cot (r = ttx', rr; rr = tr = rext)
if (rr>sto = prevState)
*stp. = prevState = tr >sto;
                                                                                            it (is.digit (***expr))
c = toxdigit (**expr);
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               name(0) • ••••expr;
if (isalpha (name(0)))
return (trandition) 0;
name(1) • ·\0';
)
if (c >= SYMEOLS)
return 1;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     maxState++;
prevState * tr->st0;
                                                                                                                                                                                                                                                                                                                                                                                                                   char name [2];
unsigned char *bcdy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tody - env-body;
```

naxState = trX->st0;
trSt = (transition \*) alloca((maxState \* 1)\*sizeof (transition));

if (trX == trOkey || trX == (transition) 0) return trX;

(\*trp) = tr0; trp = &tr0->next; } (\*trp) = (transition) 0;

return tr;

tr = (transition) 0; trp = 6tr;

while (trX)

tr0-snext \* (transition) 0; (\*trp) \* tr0; trp \* &tr0-snext;

tr0 = trX; trX = trX->next; if (tr0->st0 == 0) {

DISPOSE TRANSITION (tro);

tto = tff; tff = tff;net; tf0-set0 = tf0\*mps(c\_translate (tf0-set0, stTranslate, masState); if (tf0-set0 = mpsState + 1)

trp ettr:

c = 8\*c - todigit(\*\*\*\*expt); if ((\*expt) il) >= \*0\* & (\*expt) il) <= \*7\*) c = 8\*c - todigit(\*\*\*\*expt); cr0->stl \* trCompact\_translate (tr0->stl, stTranslate, maxState);
if (tr0->stl \*\* maxState \* 1)

continue;

DISPOSE TRANSITION (trd); continue; for (tr0 = tr) tr0; tr0 = tr0 = next)

if (tr0 = set i = FRML)

while (tr1 = tr5([tr0 = set1])

CGREP.CPP 3-24-98 11:24a

Page 9 of 13

```
CGREP.CPP 3-24-98 11:24a
```

```
static transition trConcatenateN (transition trX, unsigned N)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           static transition trilosurek (transition trX, unsigned N) {
                                                                                                                                                                                         return trherge (trSart (trA), trSart (trB));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tr = (transition) 0;
for (; N > 1; --N)
    tr = trOmcaterate (tr, trOpy (trX));
tr = trOmcaterate (tr, trX);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (trX -- trOkay || trX -- (transition) 0)
return trX;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       transition tr, trO, trPorward, *trp;
state adjust;
unsigned i;
if (tex == (transition) 0)
treat;
tr = txi,
tr = txi,
(trps) = tr;
(trps) = tr;
trps = txi = (treation) 0)
treat;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tr * ttX;
ttX * ttX->next;
Dispose_TRANSITION (tr);
tr * trClosureN (trX, N);
                                                                                                                                                (*crpA) = (transition) 0;
(*crpB) = (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (trX->sy == SYMEOL_LAMEDA)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (trx->sy -- SYMBOL_LAMBDA)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tr = trX;
trX = trX->next;
DISPOSE_TRANSITION (tr);
                                                                                                                                                                                                                                                                                                                                                                                                                                   if (trX -- (transition) 0)
return trX;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              adjust * trX->8t0 + 1;
                                                                                                                                                                                                                                                                                                                                                                                   if (trX •• trOkay)
return trOkay;
                                                                                                                                                                                                                              else
return trX;
                                                                                                                                                                                                                                                                                                                                                      transition tr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          return tr;
                                                                                                                                                  if (trX ** trOkay || trX ** (transition) 0)
return trX;
                                                                                                                                                                                                                                                                                    tro - trx;
trx - trx-next;
trx - trx-next;
trx - trx-next;
tr (tro-set - r[tabl)
{
    tro-sex - (transition) 0;
    ('trp) - tr0;
    trp - &tro-next;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            static transition trSort (transition trX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for (tro a tr; tro; tro a tro-snext)
while (trl a trSt(tro-ssto))
                                                                                                                                                                                                                                                                                                                                                                                                                                                     tr0->next = trSt(tr0->stl);
trSt(tr0->stl) = tr0;
                                                                                                                                                                                                                                                                                                                                                                                                                        else if (tr0->stl <= maxState)
                else
DISPUSE_TRANSITION (tro);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LISE(ErO-SEO) = trl>next;
trl-snext = (transleion) 0;
(*trp) = trl;
trp = &trl>next;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                transition trA, *trpA = &trA;
transition trB, *trpB = &trB;
transition tr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tr = trX;
trX = trX-snext;
(*trpA) = tr;
trpA = &tr-snext;
```

tr • trSort (tr);

return tr;

if (trX->next)

(c:)

tr • (transition) 0; trp • &tr;

while (trX)

Page 10 of 13

```
***expr;
parmske(inparmske) *
erebrae (expr. compile?) ep. erv. rparm, parms);
if (parmske/irparmskev) ** (transition) 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        trResult • ereParse (whody, compilering, env->next
                                      while (mparmstew)
trfree (parmstew(--mparmstew));
return (transition) 0;
                                                                                                                                                                                                                      while (mparmades)
    trFree {parms!ev(--mparms!ew));
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                      while (mparmsNew)
trFree (parmsNew!--mparmsNew!);
retwrn (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     •••expr:
while (*•expr ** ' || ••expr ** '\t')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        while (nparmeNew)
LrFree (parmeNew(--nparmeNew));
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               vhile (nparmsNew)
    trFree (parmsNew[--rparmsNew]);
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                saved = *8;

*s = '\0';

env = envSearch (env, (chur *)name, mpa

*s = saved;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            while (mparmsNew[--nparmsNew]);
                                                                                                                                                                                                                                                                                                                                           while (**expr ** ',');
if (**expr !* ')')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (env == (environment) 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ...eqr;
it (**eqr (* ']')
                                                                                                                                                                                                                                                                                                     практейе
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  body - env-sbody;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              static transition erebarsefinderak (
unsigned char *roop; int compilefile, environment env. int sparme,
transition *parme
                                      for (tr + trX; tr->st0 > 0; tr - tr->next)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           •••expr;
while (isalnum (••expr) || ••expr •• '_');
                                                                                                                                                 ray passition (t/b);

refo-set 0.0;

if (i = 1 1);

refo-set 1. FibA.);

refo-set 1. FibA.;

refo-set 1. FibA.;

refo-set 1. FibA.;

refo-set 1. Frost 1. Indinet;

refo-set 1. Frost 1. Indinet;

refo-set 1. Frost 1. Indinet;

refo-refo:

refo-refo:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          while (**expr ** ' ' || **expr ** '\t')
***expr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     name * ***expr;
if (!isalpha (**expr) && **expr !* '_')
return (transition) 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            unsigned char 'name, 'body, 's, saved;
int mparmsMew = 0;
transition trResult, parmsMew[9];
                                                                                                tor (; tr; tr = tr-snext)
for (i = N + 1; i > 0; --i)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tr = trConcatenateN (trX, N);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tr = trMerge (tr, trForward);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HEM_TRANSITION (tro);
tro-ssy = SYMBOL_LAMEDA;
tro-smeat = tr;
tr = tro;
                                                                                                                                                                                                                                                                                                                                                                                                                                              t:p - (transition) 0;
tip - ttrforward:
```

CGREP, CPP 3-24-98 11:24a

switch (\*\*expr)

```
cuesct as noneofficektore || e(1) is '|' || e(2) as '\0' || e(2) as '-'
return 1;
                                                                                                      for (e = 'expr - 1; 'e != ';'; e++)
if ('e == '\0')
return 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                   static transition trSymbol (superSymbol sy)
                                                                                                                                                                                                                                                                             for (i = 0: 1 < SNeDLS; i++)
if (isctype (i, cun-xcl))
match(i) = tick;</pre>
unsigned char "e;
struct ctMapStructure "ctm;
unsigned 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NEW_TRANSITION (tr);
tr-smeat • (transition) 0;
tr-smy • Sy;
tr-smt0 • 0;
tr-smt1 • EUGL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (isdigit (c))
return (todigit (c));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   static int toodigit (int c)
{
                                                                                                                                                                                                                                                                                                                                           else
match('{'} = tick;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       case 'a': case 'A':
return 10;
caso 'b': case 'B':
return 11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             case 'C': case 'C':
return 13;
case 'd': case 'C':
return 14;
case 'C': case 'E':
return 15;
return 15;
                                                                                                                                                                                                                                                     expr • 6 • 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              transition tr.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               switch (c)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return tr;
                                                                                                                                                                                                                                                                                                                                                                                  return 0;
```

CGREP.CPP 3-24-98 11:24a

for (; env; env = env-snext) if (;parms == env-sneme) == 0) if (;parms == env-sneme) == 0) static state tr $\Sigma$ upact\_translate (state st. state 'st $T_{\rm translate}$ , state sm $\Sigma$ tate)  $\{$ static environment enviseanch (environment env. char mama, int mpanna) stp0 = stTranslate;
stp1 = stTranslate + maxState;
while (stp0 <= stp1)</pre> state \*stp, \*stp0, \*stp1; if (gt > \*gtTranslate)
 return maxState + 1; return env; return (environment) 0; if (st == FINAL) return st;

if (et > \*atp)
stp. atp - 1;
else if (et < \*tp)
stp0 = stp < 1;
else if (et < \*tp)
stp0 = stp < 1;
else if (et < \*tp) static int isctype (unsigned c, ctype ct) { stp = stp0 + (stp1 - stp0)/2; tose alnum:
return isalnum (c);
case alpha:
return isalpha (c);
case asti:
return isascii (c); return isspace (c); case catrl: return iscatrl (c); return maxState + 1; switch (ct.)

case digit:
return isdigit (c);
case graph:
return isgraph (c);
case lower:
return islower (c);

Page 12 of 13

recum -1;

```
CGREP.CPP 3-24-98 11:24a
```

cyce, prolonmat ev - CORSP\_MAIL\_BN;
if ( tistatic = retrainer (expr. 1. (environment) env. -1. (timaition \*) 0) )
aworThambition = tistatic;
ceturn TPUE; int RoxGetStute( unsigned \*st0, unsigned \*st1, unsigned \*sy) { )
'/
for fire i = 0: 1 < numfransitionAllocations; i++)

free(transitionAllocation(i)); // funtion to dispuse of all the transitions in the // static chain (which will place than back into the // available pool. We then free the available pool. void Readleamp() /\*
if (savedhansition) {
 trices(savedhannition):
 savedhansition = NMLL; if (saveJTransition) {
 trFree(savedTransition);
 saveJTransition = NIL; \*gt0 = trStatic-sst0; \*gt1 = trStatic-sst1; \*sy = trStatic-ssy; trStatic = trStatic-smext; return TRUE; return FALSE; ) elso return FALSÉ; if (tiStatic)

ternru 0'

int Pexforse (unsigned char\* expr) {

case space:
return istapace (c);
case upper:
return isupper (c);
case adigit:
return isadigit (c);
}

```
if (!err.is_open())
AirlessageBox("Could not open error log file: Brow.Log");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // when to close the err file hrm. let's leave it open so we // can include error logs while the names are being translated // err.close();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   err cc "Problem with input file" cc infile cc endl;
err.close();
return FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             err << "Reading Distance Information " << infile << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                while (in.getline(strtine.GetBuffer(BUPSIZ), BUPSIZ))
                                                                                                                                                                                                                                                                                                                                                                if (!err.is_open())
    err.open("Error.Log",ios::out|ios::trunc);
                                                                                                                                                                                                                                  BOOL CDistance::Reader(LPCTSTR infile /** NUL*/)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (strline[0] == ';')
contine;
SetDistance(strline);
                         token = strtok( MLL, seps );
item+;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 striine.ReleaseBuffer();
striine.Trinkeft();
striine.Trinkight();
                                                                                                                                                                                                                                                                                                     if (infile==MULL)
infile = "Distance.rul";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Catring strium, stritten;
Catring left,match,right,output;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (!strLine.IsEmpty())
                                                                                                                      if (item >= 2)
SetDistance(a, b, Value);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ifstream in(infile, los::in);
if (tin || in.bad())
                                                                                                                                                                                                                                                                BOOL blet . TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SetDefaults();
                                                                                                                                                                            recum PALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aDistance[i][j] • aDistance[j][i] • 100;
                                                                                                                                                                                                                                                                                                                                                                                                                                             aDistance[i][j] = aDistance[j][i] = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                m_SymbolThreshold = atoi( &line[strlen("Threshold")] );
return TRUE: {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             it (_strnicmp( line, "Threshold", strlen("Threshold") ) -- 0 )
{
// Copyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                              void Chistance::SetDistance(UCHAR cl., UCHAR c2, int dist)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                int item = 0;
token = strtck( str.GetBuffer(BUFSI2), seps );
while( token != NUL )
                                                                                                                                                                                                                                                                                                                                                    for ( UCAR ]+0; j<255; j++ }
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // Set distance from a string of format // A,B VALUE
                                                                                                                                                                                                                                                                                                                               for ( UCBAR i=0; i<255; i···)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 case 2;
Value = atoi(token);
break;
                                                                                                                                                                                                                                                                                                                                                                                       it (i--j)
(
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BJOL CDistance::SetDistance( LPCTSTR line ) {
                                                                                                                                                                                                                                                                                            m_SymbolThreshold = 60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             a • · token;
break;
case 1;
b • · token;
break;
                                                                                                                                                                            abistance[ci] {c2} = dist;
abistance[c2] [ci] = dist;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CString str = 14me;
char *token;
char seps[] = ";,\t ";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          switch (item) { case 0:
                                                                                                                                                                                                                                                         void Chistance::SetDefaults()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          UCKR a,b;
int Value;
                                                                                                        int aDistance (255) (255);
                                              #include "stdafx.h"
#include "Distance.h"
```

DISTANCE: CPP 3-24-98 11:24a

Page 1 of 1

```
| Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | Joseff | J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        distanceArray(i)[0] = simpCodedistTable-yet_simpcode_distance(0,*strl) =
distanceArray(i-1)[0];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 //coming from the laft
lowest * simpoode_distrance(*stri.0) *
distanceMarray[i][5-1];
diff * simploodistrance*-spec_simpoode_distance(0,*stri) *
distanceMarray[i][5-1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 || (init : verve
|/coming itrus horse
|itr = simpcodedistrable -ger_simpcode_distance(0.*strl) +
| distanceArray(i-1) [3];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (diff < lowest - diff;

lowest - diff;

diff = simpCodedistTable - spc_simpcode_distance('strd,0) +

distanceArray([-:1][j];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Page 1 of 2
                                                                                                                                                             added when we removed the early out, since we still need to assign striktart, striktart and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           //compute rest of array starting with second row i=1;
                                                                                                                                                                    // added uten we removed tow seasy www.
// still need to assign striktatt, stn:
// the mackize
exactize = (size) > size2) ? size1 : size2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   //initialize first row - left, only
j = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (diff < lowest)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           j = 1;
strJ = strJStart;
while (*strJ != BOS)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      //first cell is 0
distanceArray[0][0] • 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            strJ = strJStart;
while (*strJ != EDS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 strI • strIStart;
while (*strI !• EOS)
                                                                                                                                                                                                                                                                                                                                                                               striStart = strl;
striStart = str2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            strJ+.;
J+.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  unsigned char *str2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EDITDIST.CPP 3-24-98 11:24a
inimponomination moral management of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // Grast ruction/Destruction
                                                                                                                                                                                                                               Cidic Distance:: CEdit Distance (CSinpCodeDistTable \ `aSinpCodedistTable)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             float (EditDistance::getDistanceScore(unsigned char 'stri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             int ordithistance::getDistanceArrayCell(int i, int j)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for (j = 0; j < (STRDGPAX+1); j++)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        distanceArray[i][j] • 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   //initialize distance array to all 0's int k=0, j=0; for (k=0) i < (STRINJOAX+1); i\leftrightarrow j
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         simpCodedistTable - aSimpCodedistTable;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *strl;
*gtrIStart;
*strJ;
*strJStart;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return(distanceArray(i)[j]);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //get size of strl
sizel = strlen((char*)strl);
if (sizel > STRDNSAX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (i > STRING-MX+1)
return(-1);
if (j > STRING-MX+1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Cidithistance:: "Odithistance()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    }
threshold = 0;
thresholdInt = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   float distance;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unsigned char
unsigned char
unsigned char
unsigned char
```

//get size of str? size2 = striem((char\*)str2); if (size2 > STRINGOX) return(-2);

// editDistance.cpp: implementation of the CBditDistance class. Copyright (C) 1998, Language Analysis Systems Inc.

```
locest = diff;
//comig from above left-
diff = simplocedistrable-set_simpcode_distance('strl,'strl) a
distanceluray(1-1|[1-1];
                                                                                                                                                                                                                                                 curbif( = simpCodedistTable-yet_simpcode_distance(0.*etrl) .
distanceArray(i.l) [0];
distanceArray(i)[0] = curbiff;
                                                                                                                                                     //compute rest of array starting with second row
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (diff < lowest)
lowest = diff;
distancekray[i] = lowest;
if (lowest < curbiff)
ourbiff = lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           )
distance = distanceArray(i-1][j-1];
return(1.0 - ((distance/DIFFMAX)/maxSire));
                                                                                                                                                                                                                                                                                                                              j = 1;
strl = strlStart;
while (*strl != BDS) '
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     )
if (curDiff > maxDiff)
return(0.0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               j...;
strJ..;
                                                                                                                                                                                   stri = striStart;
while (*stri != BDS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1...;
Str[...;
                                                                   :: ;::
                                                                                                                                                                                                                                                                                           unsigned char *str2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              //calculate maximinam number of differences to stay bajow the threshold maxDiff. \bullet ((DiFFMAX - thresholdInt) \bullet maxSite);
                                                                                                                              | | This function is identical to getDistanceScore, except that it includes code to about the routine core the number of readers at present of a pre-specified threshold. This intented is specified via the setThreshold is expecified to the setThreshold is expecified to the setThreshold in service in the setDistance of the setThreshold in setDistance of the setThreshold in the chain method re-arranges the order of the setThreshold in the come is calculated as the longer setThreshold compared such that the come is calculated as the longer setThreshold transformed to the abouter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // act longer string to strl and set abortest to strl
// also note the max size
if (size > size) | second string is bigger
// second string is bigger
}
distance = distanceArray(i-1|{j-1};
return(1.0 - {{distance/DIFFHAX}/maxSize});
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // first string is bigger
maxSize = sizel;
striStart = strl;
striStart = str2;.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        //initialize first row - left only j = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           //get size of strl
sizel * strlen((char*)strl);
if (sizel * STRING#AX)
return(*1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             //get size of str?
size2 • strlen((char*)str2);
if (size2 > STRDEDAX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        maxSize • size2;
strIStart • str2;
strIStart • str1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //first cell is 0
distanceArray[0][0] = 0;
                                                                                                                                                                                                                                                                                                                                                                                                              unisped char "str
unisped char "str
unisped char "str
int int love
fint nubb
int nubb
flout distance;
```

strd = strdStart; while (\*strd != SOS) (

Atri+;

Page 2 of 2

EDITDISI, CPP 3-24-98 11:248

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ExtRiame.cpp: implementation of the ranker class.

See ExtRiame.h for documentation.

EXTRIGNE CPP 3-24-98 11:24a

```
// initialize the array
// on difference
// o no difference
forti = 0: 1 < 256; 1+1

fort( = 0: 1 < 256; 1+1)

m_feature_distance_table(1| () > (flost) (f == ) ? 0.0 : 1.0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the overloaded function get_feature_distance can take either
too into or on unigned chars as the arguments and will return
a close value that is the feature distance between those two
IPA characters.
                                                                                                                                                              The Graitmedistrancefuls class encapsulates the feature distance table. The feature distance table is composed of the 19th characters and their feature distances stored as float wolkers.
                                                                                                                                                                                                                                                                                                                                      in feature distance_table contains the values in gracus is a generic status variable that can be checked with the age_status to furnish. If m_areaus is table then there is a problem with the table. Usually this will be due to the (dist.dat file not being loaded in property.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CFeatureDistanceTable::CFeatureDistanceTable(const_char_*fname)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // c = ips characters
// n.mrm is some float value
// n.mrm is some float value
// the float begin at position 5.
// the float begin at position 5.
// remeter this is c o- and arrays start from 0.
box) GraeureDiscareTable::load_arrays(const char *frame)
box) GraeureDiscareTable::load_arrays(const char *frame)
Copyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // read the feature distance file and load the specified // positions in the array. The formet of the file should be exactly like this // c n.mrm..
                                                          // teature distance object implementation file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \textbf{CFeatureDistanceTable}: `\textbf{CFeatureDistanceTable}() 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if((source - fopen(fname, "r")) -- NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           #include "stdatx.h"
#include "featurodistancetable.h"
// #include "defines.h"
// #include "resource.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       m_status = load_array(fname);
//dump();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   m_status . true; // default
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILE *source;
unsigned char buff[255];
char mog[255];
unsigned int x,y;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     inc i, j;
```

fprintf(fddamp, \*1.3f \*, m\_feature\_distance\_table(i)[ji);

fprincf (fdb.mp, "\n");

fclose (fddump);

sprint(meg.\*Could not open fdistdum.txt for writing\*);
AlowessageBox(meg);

if((fddamp = fopen("fdistdamp.txt","v")) == MJL)

// dump the table to a text file void (FeatureDistanceTable::dump()

int i, j; FILE \*fddamp; char msg[255];

fclose(source); return true;

garint(mag,"Could not open to for reading/reaks pure it eosiste.",Dames); Achessopica(mag); recum false;

// buff needs to be cast to char \* for fights to worth while (fights (fights \*)buff, 255, source))

float n = (float) stof ((corst char')buff + 4);
x = buff(0);
y = buff(2);
a\_feature\_distance\_table(x|y| = n;

Page 1 of 1

FEATUR"1.CPP 3-24-98 11:24a

```
If (diff < lower)

lower = diff;

//ording from above laft

diff = tenuredistrable-spec_tenure_distance('serf,'strd) +
diff = tenuredistrable-spec_tenure_distance('serf,'strd) +
distanceArray(i-1|j-1|);

if (diff < lower)

lowest = diff
distanceArray(i|j| - lowest;

j+:
getsi-:;
                                                                                                                                                                                                                                                                                                                                                                                                                                                //cming from the left
loses: = featureDistTable -ger_(centure_distance(-str1,0) +
distanceArray(i)[j-1];
diff - featureDistTable -ger_feature_distance(0, str2) +
                                                                                                                                              distanceArray(0) [j+1] • featureDistTable-spst_feature_distance (0, *stnJ) distanceArray(0) [j]:
                                                                                                                                                                                                                                                                                                                               distanceArray[1][0] = featureDistTable-yet_feature_distance(0,*strl] + distanceArray[1-1][0];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Page 1 of 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This function is identical to getDistanceScore, except that it
                                                                                                                                                                                                                                            //compute rest of array starting with second row.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               distance = distanceArray(i-1)(j-1);
return (float)1.0 - (distance / maxSize);
                                                  //initialize first row - left only | - 0;
                                                                                                                                                                                                                                                                                                                                                                       j = 1;
strj = strjStart;
while (*strj != EOS)
{
                                                                                                                                                                                                                                                                                    strl = strlStart;
while (*strl != EOS)
                                                                                                strJ = strJStart;
while (*strJ != BOS)
                                                                                                                                                                                 atedor;
jee;
                                                                                                                                     Feature2ditDistance::Feature2ditDistance(CFeatureDistanceTable *aFeatureDistTable)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              added when we removed the early out, since we still need to assign striStart, striStart and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        float PeatureEditDistance::getDistanceScore(unsigned char *strl.
                                                                                                                                                                                                                                              for (j = 0; ) < (STRINGWA+1); j++)
                                                                                                                                                                                                                                                                               distanceArray(il[j] = 0;
                                                                                                                                                                           //initialize digrance array to all 0's int i = 0, 3 = 0; for {i = 0; i < (STRDFWAX+1); i++)
                                                                                                                                                                                                                                                                                                                                                                   featureDistTable = #FeatureDistTable;
                                                                                                                                                                                                                                                                                                                                                                                                                 FeatureEditDistance:: FeatureEditDistance()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    //get size of strl
sizel = strlen({char*)strl);
if (sizel > STRINGOM)
return(-1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           //get size of str2
size2 = strlen{{duar}str2};
if {size2 > STRIAD4AX}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  *strl;
*gtriStart;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   •strJ;
•gtrJStart;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        int um
float distance;
                                                                                                                                                                                                                                                                                                                             )
threshold = 0;
```

//first cell is 0 MistanceArray[0][0] = 0;

// the exaction mactice = (siral > siral) ? siral : siral; errittar = strl; stribtar = strl;

の行う、全種を表が、一般など、を見て、から、大きなな、このであった。

// PestureEditDistance.cpp: implementation of the PeatureEditDistance class.

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FEATUR 2.CPP 3-24-98 11:248

```
lowert = diff;
//coming from above left,
diff = feature/distrable-spet_feature_distance(*strf,*strf)
if (diff < lowert)
if (diff < lowert)
                                                                                                                                                                                                                                            //coming form above
diff . featureDistribule-yes. feature_distance(0, strl) .
distanceActey(1-1]();
                                                                                                                                                                                                                                                                                                          lowest = diff;
diff = featureDisTable-spm_feature_distance(*stml,0) +
distanceArray[1-1][j];
if (diff < lowest)
                                                                                                                                                                        diff = featureDiscTable=spet_feature_distance(0,*strJ)
distanceArray(i] [j-1];
if (diff < lowest)</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         lowest = diff;
distanceArray(i| [j] = lowest;
if (lowest < curbiff)
curbiff = lowest;
distanceArray(i)[0] - curbiff;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             distance = distanceArray[i-1][j-1];
return (float)1.0 = (distance/maxSize);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          )
if (curbiff > meabiff)
return(0.0);
                                      j = 1;
stul = stulStait;
while (*strl != BOS)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           //calculate maximimam number of differences to stay below the threshold maxiff \bullet (1 - threshold) ^\circ maxiffs;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // set longer string to strif and set shortest to strif
it (sits) = sitel)
// second string is bigger
smoother = sitel;
strifeart = sitel;
strifeart = strif;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // first string is bigger
maxSize = sixel;
striStart = strl;
strJStart = strl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              //initialize first row - left only
                                                                                                                                                                                                                                                                                                                                     //gst size of strl
sizel = strlen((char*)strl);
if (sizel > STRINGWAX)
return(-1);
                                                                                                                                                                                                                                                                                                                                                                                                                                //gec size of str2
size2 * strlen!(char*)str2);
if (size2 > STRIMDWAX)
return{-2};
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       //first cell is 0
distanceArray[0][0] = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         j = 0;
strJ = strJStart;
while (*strJ t* EOS)
                                                                                                                                                                                                                      float naak
float cur
float cur
int max
```

outDiff . featureDistTable--get\_feature\_distance(0,\*strf)
distanceLrry[i-1][0];

// Nee that this method re-arranges the order of the strings baing orquer exting for order of and that the cost is calculated as the longer string larger string. I have transformed to the shorter. I have transformed to the shorter.

//compute rest of array starting with second row  $1/\cos p_{\rm cl} = 1/1$  = 1/1 = 1/1 = striftart; etti = 1/1 = 1/1 = 1/1 = 1/1 = 1/1

Page

FEATUR 2.CPP 3-24-98 11:24a

age 2 of 2

```
sprint(lerrieg, "Extor seaking to offset td in map file", testPosition * mapltemSits);
AthessageBax(exfep);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Page 1 of 1
                                                                                                                                                                                                                                                                                                                                                                                                                             // into the map. That is, make the top the test position if (top := testPosition)
top := 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tempString = ((dhar *)returnMepBntry) + ucvMeyOffsetInStructure;
compRetCode = tde_unsigned_etromp((const_unsigned_char *)tempString,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FILESE 1.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                      UCMAp::getMapEntryForUCV(const char *ucv, map_entry_t
                                                                                                                                                                                                                                                                  done - PALSE;
found - PALSE;
                                                                                                                                                                                    // see the note abou the original location of this function // in the UCMMap.qpp file.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         {
if (top >= bottom)
dere = TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            )
else (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AtxMessageBox (msg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (completCode == 0) {
    tound = TRUE;
    done = TRUE;
#include cuse_ansi.hb
#include cfstroamb
#include cioatreamb
#include cstdlo.hb
                                                                                                         #include "stdatx.h"
#include "UCPMap.hpp"
#include "tds_util.h"
                                                                               using namespace std;
                                                                                                                                                                                                                                          JOOG ,
```

"// emp value is greater than the one we are looing for,

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into the map. That is, make

```
// now dealth
isOup = PALSE;
for (int ) = 0; ) < navkariantsCorrhisters; j++)
if (variants) [j]) {
isOup = TALS;
                                                                                                                                                                                                                                                                                    /// 90 through and add the variance to our local list for this
/// name. If repeated, dead and remove veels.
for (int i = 0; i < ordina.m.variance.desize(); i+>) {
    variancistring = ntables.m.variance(ii);

                                                                                                                                                                                                                                                                                                                                                                                                                                           variantStringEr = variantString.GetBuffer(1000)
for (p = q = variantStringEt; p |= '\0'; p >+)
if (etrchr[ANILO_CONSDANTS, 'p) |= NIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sprintf (errorMsg, "Error in regular expression:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              variantString.ReleaseBuffer();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Page 1 of 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               truncate the UCV string to the size specified by \mathsf{ucv\_len}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (isDup .. PALSE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            errorMsg[1000 + 1];
                                                                                                                                                                                                                                                                                                                                                                                               // remove youels
if (devowel) {
                                                                                                                                                                                                                                          manNariantsPorThisName = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .o\. - b.
                                                                                                                                                                                                of affects . Walk (0, etc) ,
           if (rec. indepcy() == PuLSB)

If (indepct, Set (rest))

Const date

Const date

Char

Controp

Boot.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               )
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .. neBuf);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BOOL translateName, int truncien
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENVAR 1. CRP 3-24-98 11:24a
function to generate the consonant variants for a name using the cult as set.

I placed this code in a separate file so that .

I could use optimization, which causes a problem with the rest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The truncion parameter can be used to truncate values. Any deplicates caused by such trunction are discarded. A truncion of 0 indicates that no truncation should occur.
                                                                                                                                                                                                                                                                                                                                                                                                                                         name can be a regular expression (in which case translate/dem und be PALSE), or just a string that needs to have rules applied it (in which case translate/dem abound be TAUE). If we are nolating, the name will automatically be surrounded by spaces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The devowel flag, when TRUE, indicates that wowels should be removed from the generated variants. Again, any duplicates caused by such modification are discarded.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tds_vargen_code_trr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   spacedkame [1000];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          variantString;
nfaData;
                                                                                               of parse.cpp, and so that nors quickly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    . . . xa.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          vector<CString> *variants • new vector<CString>;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (*name !* ')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .. ets updated when devoweling
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    rc - TDS_VARGEN_CODB_CK;
if (translateName)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    namePtr . "";
rex = name;
                                                                                                                                                                                                                                                                                                                                               extern ofstream err;
                                                                                                                                                            Binclude "stdafx.h"
Binclude "parse.h"
                                                                                                                                                                                                                            sittlet CONSTINUEX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CString
ONFa
CString
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else
```

Page 2 of 2

GENVAR 1 CPP: 3-24-98 11:24a

return variants

```
meg. Format ("Error: only read to Items from Group Mup file ta",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             itemsRead - fread((char *)mapData, sizeof(group_map_entry_t),
                                                                                                                                                                                                                                                                                                                                                                                                                              neptata - (group_nep_nep_ntry_ptr_t) new group_nep_entry_t(nunGroupsInNop); if (neptate i- NOLL) \{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             *nameFlleOffsets * new set<unsigned int>;
*queryGroupString.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for (querydrouples - groupSet. begin(); querydrouples !- groupSet.end(); querydrouples - ()
reset the bin search variables for each item in the querydrouples top - 0;
top - 0;
botton - nandroupsimyop - 1;
done - false;
while (forms) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (grouphappile == NULL) {
    meg.format("Could not open Group Nep tile %", grouphapfilekune);
    AlahessapeBox(nog);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            •matchingMapEntry = MUL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   top;
bottom;
testPosition;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  queryGroupString • (char •) (LPCISIR) *queryGroupIter;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (itemsRead != nunGroupsIrMap)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Page 1 of 2
                                                                                                    // if we found a file with same map entries
if (nandcoupslanksp > 0) {
    groupWapPile = fopen(groupWapPileName, "th");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 At xMessageBox (msg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          testRosition = top + ((bottom - top) / 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Status - true;
map data not NULL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ) // map da
fclose(groupMapFile);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       set.cString>::iterator queryGroupIter;
set.cursigned int>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (mapCata := MUL)
    delete () mapCata:
if (groupNameOffsetVectors := MUL)
    delete groupNameOffsetVectors;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             *> :wmGroupsInMap, groupMapFile);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ** itemsRead, groupMapFileName);
                                                                                                                                                                                                                                                                                                                                                                                                                         else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  group_mup_entry_c
bool
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GroupData:: 'GroupData()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unsigned int
unsigned int
unsigned int
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meg.Pormat("Error: Group map file is not divisible by sizeof map entry", g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CSimpleEditDistance *a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         float anEditDistThresh
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (stat(groupFupPlidume, statebut ) == 0) {
    // The size of an entry is the size of the structure
    // The size of an entry is the size of statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, statebut, stateb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GroupData::GroupData(const char 'groupMapFileName, const char 'groupNameOffsetaFileName,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GROUPD 1.CPP 3.24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    At xMessageBox (msg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   edicDistancizer * anEditDistancizer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nanGroupsinNup - 0;
status - PALSE;
editDistThresh - anEditDistThrésh;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    open the group/apFileName
// GroupSata.cpp : urplementation file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         grouptimedifiset vectors - NULL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           •groupWapFile;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mitted DERIG
madefine new DERIG, NEW
madefinis FILE
starte chur THIS FILE.!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else
                                                                                                                       ·sys/types.h.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #include "GroupGata.h"
#include "GroupGata.h"
#include "cds_util.h"
                                                                                                                                                                                                                                    #include cuse_ansi.h.
#include cfstream>
#include ciostream>
#include cstdio h>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    rupData - NULL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .. roupMapFileName);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *> nbdicDiscanciter,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CString mag:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         using numberace std;
                                                                                                                       #include
```

mag. Format ("Could not stat the map file is", group/epfileName); AfriessageBox (mog);

28

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```
· ffset,
                                                                                                                                                                                        . CB)
                                                                                                                                mapData(testPosition).n
                                                                                                                                                                                                                                                   mapData[testPosition].n
                                                                                                                                                                                                                                                                                                                                                                                                                map value is greater than the one we are looking for, s
                                                                                                                                                                                                                                                                                                                                                                                                                                            into the map. That is, make the bottom the test posit
                                                                                                                                                                                                                                                                                             // into the map. That is, make the top the test position
if (top ** testBosition)
top ** 1;
/// narrative paragraph number 4.3.3
ser.umsigned int> Groupbara::gechamoffserifordroups[ser.CString> bgroupber.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -matchingMapEntry * NULL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       bottom . testPosition;
                                                                                                                                                                                                                                                                                                                                                         top - testPosition;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (bottom == testPosition)
bottom += 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         set.Girting>::iterator queryGroupsatBrd = groupset.\( \frac{2}{3} \text{rd} \text{1} \) set.\( \text{Girting}>::iterator \text{queryGroupsetBegin} = groupset.\( \text{Degin(1)} \);
                                                                                                                                                                                            if (top >* bottom)
done * true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           group_map_entry_t
set.CString>::iterator queryGroupIter;
set.cursigned int>
                                                                                                                                                                                                                                                                                                                                                                                        el se
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                int 'manGroupsThatPassedGroupEditDist,
                                                                                                                                                               done . true;
                                                                                                                                                                                                                                    else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  }
return nameFileOffsets;
                                                                                         .. amilisetsOffset,
                                                                                                                                                                                                                                                                                                                                                                                                                               .. o look backwards
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .. bool *stopVar)
                                                                                                                                   .. unitem#Offsets);
                                                                                                                                                                                                                                                                                    .. ook further
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ::
```

Page 2 of 2

GROUPO\_1.CPP 3-24-98 11:24a

mapData[i].nameOffsetsO mapData(i).numbareOffse

queryGraptice is queryGraptice to queryGraptice de queryGraptice.)

(if (edithistScore = edithisthres))

(if (edithistScore = edithisthres))

("naminoupsilvatNessedirougblithist)"

as our associated groupsimofiter/become object for the offsets

// or the name but could have produced this group.

groupNamoffiset/wetors-baddNewsifiset(innef).

```
)
else {
meg.Format("Error: Group Names Offsets file %s - could not all
filets
                      { mog.Format('Error: Group Names Offsets file %s is not divisible by sizeof una
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          unsigned int manoffsets)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 insigned int startOffset,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meg.Formut("Could not open Group Name offsets file %s", fileName);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 msg.Format ("Could not stat the map file %s", fileMane);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  function to read the specified number of offsets from the mame offsets date, scatting at the specified offset. Each offset read is added to the set that is passed in. Groupkemoffsetviectors: addkimsoffsets leat-unsigned into toffsetSet,
                                                                                                                                                                                                                                                                                           A£xNessageBcx (msg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          )
folose(groupNamsOffsetsFile);
groupNamsOffsetsFile = NALL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A£oMessageBox (msg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // not loading memory
// so keep file open
status = TRUE;
                                                                                                                                                                                                                                               itemsRead, totalOffsets, fileName);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GroupManeOffsetVectors:: GroupManeOffsetVectors()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .. ocate space for %d offsets".
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else
                                                                                                                                                      -> Name Offsets file %s",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .> me, totalOffsets);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                +> igned int",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if isea (grouplumo)feetsPilelum, Estafahf ) == 0) {

the basis of an entry is the size of the structure |

if (isealbhf, st. size 1 sizeof(unsigned int)) == 0) |

tocaloffeets = seable, st. size 0 sizeof(unsigned int) |

itse offeet is the 0 based into size of sizeof unsigned int) |

itse offeet is the 0 based into size the begin |

itse of the file) of the inspinancy entry just past the begin |

itse and into the file.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gropemoty)
gropemotisets - new unsigned intitocalOffsets);
if (gropskanOffsets !: NLLL) {
int items@newt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           hottocersise is MALD.

Lear the file and get the file size
from that. It we are loading into memory,
use sizeof(unsigned int) to determine the many offeres there are those many unsigned into electronic to many offeres there are those many unsigned into a service and allocate space for).

It we are not loading into memory, then we should note the final offere so that we do not attempt to seek or read past that the file are should be evenly divisible by the size of unsignal into.

Note that the file are should be evenly divisible by the size of unsignal into.

Note that (for gone reason), the code below will not compile unless pre-compiled headers are turned off.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GroupkingOffsetVectors: GroupkingOffsetVectors(const_char_fileHans, bool useMentry)
// Capyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             usingMemory = useMemory;
if (usingMemory)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // cave the file name
group/amod/forestible/ame . (libkame,
qroup/amod/forestible group/amod/forestible ;
group/amodforestible . fopen(filekame, "t");
                                                                                                               // GrouptlangittsetVectors.cpp : implementation file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ### DEBAG | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK | BANK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               groupkingsfisetsfile = MUL;
groupkingsfisets = MUL;
totalOffsets = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Finclude "Stdatx.h"
Binclude "GroupKan-OffsutVectors.h"
Finclude "tds_util.h"
                                                                                                                                                                                                                                                          sys/types.h
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          status - false;
                                                                                                                                                                                                                                                                                                                                                                                          #include <fstream=
#include <fostream=
#include <stdio.hx
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Cotring reg;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .. igned int),
                                                                                                                                                                                                                                                          anctus:
```

Page 1 o

GROUPN"1,CPP: 3-24-98 11:24a

```
else {
    if (fseek(groupNamoOfsetsFile, staitOOfset, SEEK_SET) == 0) {
        for (i * 0, i * numOfsets; i-+) }
        for (i) * 0, i * numOfsets; i-+) }
        subject (fseekset; i-+) }
        offsetSet->Insert(teerpalamoOffset);
                            (Lecrs
                                                          numott
                                                                                                                                                                                                                                                                                                                                                                                           offset vectors "start
                                                                                                                                                                                                                                                                                                                                                                                                                                            (LPCTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ThumOff
start
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Catring mag, mag.forms: File Ng, could not seek to offset Nd in Group Names "
                                                                                                                                                                                                                                                                                                                   unsigned int 'offsetPtr - Gyroupkareoffsets
for (1 - 0, 1 < namOffsets; 1.+)
offsetSet->insert('offsetPtr);
offsetPtr+;
                                                                                                                                                                                                                                                                                                                                                                                                                             ** ing at offset Nd in Group Hames Offsets file",
               .. ing at offset %d in Group Names Offsets file",
                                                                                                                                                                                                                                                           ( file based // unsigned int tempkamoffset;

    (LPCTSTR) groupManeOffsetsPfleMane,

                                             .. TR) grouptameOffsetbPileName,
                                                                                                                                                                                                                                                                                                                                                                                                                                                             •> TR)groupNameOffsetsFileName,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 +
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .> sets, startOffset);
                                                                             .. sets, startOtfset);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .. *Offsets file *,
                                                                                                                   e 13e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .> startOffset);
                                                                                                                                                                                                                                               }
else
```

if (using/Aemory) {
 int arrayindex \* startOffset / sizeOf(unsigned int);

GROUPN"1,CPP. 3-24-98 11:24a

```
// The method Walk() might need a better name. It walks all the paths // within the state sable and when reaches (the FiRML state it adds that // path (or variant) to an array of CString Variants found in m.variants
                                                                                                                                                                                                                                                                                                                                                                                                                                                    // The parameter chr is really just for recursion so it is defaulted // to Will for the first call
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (symbol ** SYMBOL_SIGMA)
for(char c*'A'; c<*'Z'; AddToLastGlars(c++));</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ), den't walk if Otta not valid or something interplaced // the Otta processing - Oneck is m_bCancel still 'necessary if (m_bCancel) return;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // grow the array if needed
if (Stacebos >= m_states.CetSize() )
m_states.SetSize(Statebos+1); // state is zero based
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        void CHa::Walk(TICHOR state, CString str, char chr /* * MUL */ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           while ( Peekdhessage(Amsg, NULL, 0, 0, PM_REMOVE) )
DispatchWessage(Amsg);
                                                                                                            // AAI) adds a transition to the state table. Calls the AAI function from State. The call to Adfibuacionsisty is currently un-meeded but might be used for future // optumization.
                                                                                                                                                                                                                                                int Cifa::Add(TCIAR state, TCIAR next, unsigned symbol)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // time consuming so check for windows messages
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // final takes the 0'th element in the array
int StatePos * ( state ** FDQL ? 0 : state );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       retuin m_states[StatePos].Add(next, symbol);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AddToFirstChars(symbol);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AddToLastChars(symbol);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (state**FDBL)|next**FDBL)
                                                                                                                                                                                                                                                                                                               if (symbol >= SYMBOL_INVALID) return -1;
^{\prime\prime} Implementation file for class Oifa ^{\prime\prime}
                                                                                                                                                                                                                                                                                                                                                                                               if (state==0||next==0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         else
```

LASNFA.CPP 3-24-98 11:24a

sprint(lerrMeg, "Variants now td", m.variants.GetSize());
AfaMessageBox(errMeg); // isettwich() looks for a match against a particular string pointer. this method
// is specifically designed to for the LETT CONTEXT of a nule.
// The Odts class cut be set up in reverse note as indicated by the member in believerse.
// The method scenar the name backwards by first calling whosebecraef them starting
// the LettstringwatchWalk(), since its walking backwards it starts with FiNAL as the Malk( m\_states(state).m\_aTrans(i].next,ThisStr, ThisGhar ); if (int) (m\_states[state].m\_aTrans[i].next) == -1 )
{ ThisChar - (char) m\_states(state).m\_aTrans(i).symbol; ) else if( state = m\_states(state).m\_aTrans(i).next )  $\ensuremath{//}$  maintains a CString of the possible first characters for this  $\ensuremath{//}$  state table, used in early out situations // maintains a CString of the possible last characters for this // state table, used in early out situations if (m\_FirstChars.Fird(c) < 0 } // not already there
 m\_FirstChars +\* (char) c;</pre> char ThisChar; for { int i=0; ion\_states|state|.GetSize(); i++ } { m\_variants.Add(ThisStr+ThisChar); // go on the next transition void Onta::AddToFirstChars(TCIAR C) void ONfa::AddToLastChars(TCHAR c) el se recurn;

this is the first time through, so check to see if

|| this NR has the m\_bands first set, which indicates

|| this tree of the possible workness is the serys string|| that care of the possible workness is the serys string|| that variant is not included in the state tables, so

|| we must pick it ouff separately.

|| (m\_bands) {
| (m\_wariants.Add("");

CString ThimStr(str); if (chr) ThimStr += chr;

el se

#ifnJef Dil\_BUILD #include "Distance.h" #include "cgrep.h" Page 1 of 7

```
if( StringMatchMalk( m_states(state).m_aTrans(i).next ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if ( (int) (m_states|state|.m_alvans[i].next) ** -1 }// tound Filed.
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // SubStringfactoHealk() walks the state table checking against the passed string for // a match. It's different from the other match walks in that when it fails it simply // moves the string pointer forestr and tries again.
// More this just recurs the first substring that matches, a regular expression // match many times in a string.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (*(namm+1) ** '\0') // no more name to go
;// so go no further
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // first check to see if the Offa is signa (pre-defined as any character) if (in bolgma) return TRUE; return Substringfactaivals(0.name, pRos., pOount);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // Matched the whole regex so return true
return TXUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BOOL Cifa:;SubStringMatchMalk(TCMAR state, LPCTSTR name, int "pRos, int "pCount)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                unsigned ThisChar • m_states(state).m_aTrans(i).symbol;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if ( *name -- ThisGhar || ThisGhar -- SNBOL_SIGM )
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                  // Subvacchi) returns TAUE if this Offa matches any portion of the // passed string.

BOOL Offa::Subvacch(LPCTSTR name, int "pAbo, int "pCount)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for ( int i.0; i.m_states(state).GetSize(); i++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      bCharMatched = TRUE;
(*pCount) ++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          else // more path to go
                                                                                                                                                                                                                                                            } return bRet; // didn't get out of this state
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (!bcharMatched)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               } // endif *name==ThisChar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          else
                                                                                                                                                                                                                                } // endif 'name--ThisChar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BOOL bCharMatched • FALSE;
BOOL bRet • FALSE;
while ( 'name )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -> , pcount ) )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if( LeftStringMatchMalk( m_states(state_index).m_aTrans(i).next , name
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if ( int) (m_states[state_index].m_aTrans(i].next) -- 0 )// found START
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // Matched the whole regex so return true, but not // just yet, there may be more of the string to mutch bket = TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // this path is done and haven't reached EOS
// so go no further down this path
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LASNFA, CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            int state_index * ( state**FDRL ? 0 : state }; // use index 0 for FDRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                            // intiStingAucidalk is like the other Malk functions except it only // wants on reversed Olfa objects. Other than special consideration of state // FifeL and state O its much the same as the others which follow. Poburt is // set to the marker of characters which matched.

// cut to the marker of characters which matched.

// cut integrate the continuation of the state. LECTSTR name, int 'PGOunt)

{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if ( *(name+1) ** '\0') // no more name to go // ; // so go no turther?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                unsigned ThisChar - m_states[state_index].m_aTrans[i].symbol;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (*(nume+1) = '\0') // found EDS
return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             it ( *num ** Thisthar || Thisthar ** SWEOL_SIGNA )
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BOOL bCharMutched * FALSE;
for { int i=0; i-m_states[state_index].GetSize(); i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return TRUE;
                                                                                                                                                                                                                                                                                                                          )
Scring mane(name,len);
mane, Makelenverze();
return LeftScring/acciMalk(FDBL, mane, pCount);
bCharMatched - TRUE;
(*pCount) **;
                                                                                                                                                                                                      if (! strchr( m_LastChars, name(len-1) ))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else // more path to go
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    it (!bCharMatched)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else
                                                                                                                                         if (m_osigna) return TRUE;
                                                                                                                                                                                                                                                            *pCount * 0;
return FALSE;
                                                                               ASSERT (m_bReverse);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ASSERT (m_bReverse);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BOOL bRet * FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -- -1. pCount 1 )
```

Page 2 of 7

```
if ( *name == ThisChar || (unsigned)ThisChar == (unsigned) (TCHAR)SYMFOL_SIGM )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // quick check to look at possible first characters in the NTA
// to see if any each the first character in the name being eatched.
if (stroth(m_FirstChars, 'name) == NULL)

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // as a final check, see if the MGA can be MAIL (e.g. a?).
// These MGA match everything. Note that we wait till the end so there give Stringstendback a chance to find the longest possible match. For example, the MGA at 1 match 1 the MGA a with a length of 1, not a length of 0. The MGA if (rc = FALSE)
                                                                                                                                                                                                                                           // The following two functions are like Subscath() and SubStringBatchMalk()
// above except the StringBatchMalk function will continue after it has matched
// inorder to see if it can find a lorger match down some other path.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // find the longest match. Note: this function doesn't reset bRet to FALSE // once it is set to TRUE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Page 3 of 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       unsigned ThisChar - m_states[state].m_aTrans[i].symbol;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BOOL ONFa::StringMatchMalk(TCMAR state, LPCTSTR name, int "pCount)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       {
rc = StringMatchMalk(0, name, pCount);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BOOL bCharMatched * FMLSE;
BOOL bRet * PALSE;
for ( int i=0; ion_states(state).GetSize(); i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           bdrarMatched • TRUE;
(*pCount) **;
                                                                                                 ) return bRet; // didn't get out of this state
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (!bChartNatched)
{
                                                               ) // endif *neme==ThisChar
                                                                                                                                                                                                                                                                                                                                                                      BOOL Offa::Match(LPCTSTR name, int *pCount)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     *pCount * 0;
rc * FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (m_bSigma) {
.pCount = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     rc . TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else
                                                                                                                                                                                                                                                                                                                                                                                                                              900F rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    recurn rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if( CompleteStringMatchWalk( m_states(state).m_aTrans(i).next , name+1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 it ( *name ** ThieChar || (unsigned)ThisChar ** (unsigned) (TGRAR) SYMBOL_SIGMA )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if ( [int) (m_states[state].m_aTxans[i].next) -- -1 }// found FINGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // Matched the whole regex so return if we also found
// the end of the string
if (*(name*!) ** '\0') // found BDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // this path is done and haven't reached BOS
// so go no further down this path
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LASNEA.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if ( • (name-1) ** • \Q ) / { no more name to go //;
                                                                                                                                                                                                                        // the Following two methods CompleteBatch() and CompleteStringMatchMalk()
// are like the corresponding submatch function except they will only return
// TRUE it the final state is found in both the Offa and the string.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // walks until both final status are found or returns FALSE
//
//
// BOOL CHAH:COmpleteStringWatchWalk!TORAR state, LACTSTR name, int "pCount)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         unsigned ThisChar • m_states[state].m_afrans(i).symbol:
)
Det . FALSE; // didn't get out of this state
rame..;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BOOL bCharMatched = FALSE;

BOOL DRet = FALSE;

for { int i.d. icm_states|state|.GetSize(); i++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return CompleteStringMatchWalk(0, name, pCount);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            bChatMatched • TRUE;
(*pCount) ••;
                                                                                                                                                                                                                                                                                                                                                       BOOL Cita::CompleteWatch(LPCTSTR name, int *pCount)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else // more path to go
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (! strone( m_FirstChars, *name ) )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (!bCharMatched)
                                                                                                                                                                                                                                                                                                                                                                                                       if (m_luSigma) return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *pCount = 0;
return FALSE;
                                                                                                            return bRet,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ., prount ) )
```

```
if ( (int) (nfa.m_states|ThatState|.m_afrans[That_i].next) ** -1 )// f-
                                                                                                                                                                                                                                                                                                                                                                                                       if( Ntakutchkalk( nfa,
m_states[ThisState].m_aTrans[This_i].next ,
nfa.m_states[ThatState].m_aTrans[That_i].next , level+1
                                                                           // This path is done and haven't reached the end of That path // so go no further down That path
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // calls the parsing routines to retrieve the transition
// innovation it calls the Add) reschal or create the state table:
// innovation it calls the Add) reschal or create the state table:
// innovation innovation calls and innovation calls are the states to be added
// in reverse order. This is for regular expressions on the left-hand side
// of a rule which have to scan in reverse order.
                                                                                                                                                                                                                                                                                                                    ;// so go no further
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   recurn TRUB;
                                                                                                                                                                         }
else // more This path to go
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  } return FALSE; // didn't get out of this state
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // endif ThisChar--ThatChar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if ( !RexParse((unsigned char*)buf) )
    return FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BOOL CMfa::Set (LPCTSTR pRex, BOOL bReverse )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (stromp(pRex," ") ==0)
n_bBoundry = TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 unsigned s0*0,s1*0,sy*0;
char buf(BUFSIZ+1);
strncpy(buf,pRex,BUFSIZ);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              m_bReverse - bReverse;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      m_PirstChars.Empty();
m_LastChars.Empty();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          m_bismich = FALSE;
m_bsigne = FALSE;
m_bBoundry = FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RenoveA11();
                                                                                                                                                                                                                                                                                          . ound That FURL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -
-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if ( (int) (m_states(ThisState).m_aTrans(This_i).next) ** -1 )// found This PI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if( StringAstenMalk( m_states(state).m_afrans(i).next , name+1, pCount
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (ThatChar ** ThisChar || ThatChar ** SIMBOL_SIGM || ThatChar ** SIMBOL_SIGM |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for ( int That_i=0; That_i=a_states(Thaifstate).OctSize(); That_i++ {  \frac{7}{7} }
// Matchad the whole reger so return true, but not // just yet, there may be more of the string to match blet - 100\,M_\odot
                                                                                                                                                                                                                                                                                                                            // this path is done and haven't reached BOS // so go no further down this path
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ThatChar • nfa.m_states(ThatState)/m_aTrans(That_i).symbol;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BOOL CMfa::MamatchWalk(CMfat nfa, TCMR ThisState, TCMR ThatState, int level)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (*(name*1) ** '\0') // no more name to go
.;// so go no further
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // The following two methods are like the methods above except that instead // of comparing the following the astring they compare with another Citie // Instead of just moving on to the most character in a string as above. These // Lucrism wave to the most state in m_states[]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               unsigned ThisChar, ThatChar; for ( int This_i+0; This_i+m states(ThisState).GetSize(); This_i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ThisChar • m_states(ThisState).m_aTrans(This_i).symbol;
                                                                                                                                              if ( *(name*1) ** '\0') // found EDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if ( m_FirstGars.FindOwOf (nta.m_FirstGars) ** -1 )
return FALSE;
                                                                                                                                                                                                           return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return bact; // didn't get out of this state
                                                                                                                                                                                                                                                                                                                                                                                                                          }
else // more path to go
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ) // endit 'name--ThisChar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return HiaMatchWalk(nfa, 0, 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BOUL Offia: :Match(Offia£ nfa)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Z NAT
```

if ( (inc) (nia.m\_states(ThatState).m\_aTrans(That\_i).next) -- -1 )// f

return TRUB;

if ( (int) (m\_states(state).m\_afrans(i).next) -- -1 )// found FINAL

Page 4 of 7

LASNEA.CPP 3-24-98 11:24a

```
pod. Onea: mitherchealk (Lectivity grave_offsets, Lectivity buf_atake, troug fluestate, troug Bufseate, int sideald ... istance )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if ( (int) (m_states(ThisState).m_aTrans(This_i).next) .. -1 )// found This FI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (sourdistance.Pass(BufGrar,ThisChar) /*BufGrar -- ThisChar*/ || BufChar -- SYMBO)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                int next_state • (int) buf_state(Buf_i+1);
LPCTSTR next_buf • STATE_BUF(next_state); // &state_offsets|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // This path is done and haven't reached the end of Buf path \ensuremath{//} so go no further down Buf path
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (BufChar ** ThisChar || BufChar ** SYMBOL_SIGM || ThisChar ** SYMBOL_SIGM )
// the first terminated string in buf is firstchars
// skip the first chars
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if ( lint) buf_state[Buf_i+1] •• -1 )// found Buf FlbdL return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if ( (int) but_state(But_i+1) -- -1 )// found But FINAL :// so go no further
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // The "Malk" function for the "Natch" function above. The assertion that buf is divisible | // y? sibcs that the little is a sicking of the target of frametion records which have a length of J. Pestition 0 in each record is the current sate (i.e. Thut,i) Pestition 1 is the next state (i.e. Thut,i) Pestition 1 is the next state (i.e. Thut,i) to stored symbol is the third byte (That_i,i.e.).
                                                                                                                                                                                                                                                                                                                                                                                                                          int TotalDistance;
recum BufMutcHelalk( state_offsets, STATE_BUF(0), 0, 0, TotalDistance );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ThisChar . (UCMAR) m_states(ThisState).m_aTrans(This_i).symbol;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for ( int This_i=0; This_idm_states (ThisState) .GetSize(); This_i++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tor ( int Buf_i=0; Buf_i < (trans_count*3); Buf_i+=3 )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else // more This path to go {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BufChar = (UCRAR) buf_state(Buf_i+2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             int trans_count = (int) buf_state[0];
buf_state **;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                it ( soundDistance
-> _SIGM || ThisChar == SP#BOL_SIGM )
#else
                                                                                                                                                                                                                                                                                                                                                              LACTSTR state_offsets * p;
                                                                                                                                                                                                                                                             int state_count;
state_count = (int)buf[0];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 UCHAR Thischar, Bufchar;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     => (int)state_offsets(i+1|-1;
                                                                                        size -- len + 1;
len = strlen(p);
p += len + 1;
size -= len + 1;
len - strlen(buf);
p -- len - 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    #1Endef DLL_BUILD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 fendif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // The following two methods are like all the previous "watch" and "walk" methods

// except that the second for parameter) Dida is in the form of a buffer which was
// read from disk. [the result of the <-coperator) This malgas the management a little
// see since the match is done on the buffer itself varifoot any conversion. It's a
// little weak in that only forward (lowing Offa's can be Seearched (see comment below).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LASNFA.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for ( int trans-0; trans-m_states(state).GetSize(); trans++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  #dwfine STATE_EUF(i) (LECTSTR) &state_offsets[ (int)state_offsets[i+1] ]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        display. Forms ("<1)d : 1)d : 1c>\n", s0, s1, sy);;
TRAC (display);
out << display;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               s0 * state;
s1 • m_states(state).m_aTrans(trans).next;
sy • m_states(state).m_aTrans(trans).symbo);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // trace() is a debugging method which chaps the contents of the
// state table to the debug window and to an output stream.
void Offa::trace(ostreams out)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for( int state=0; state=m_states.GetSize(); state++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     display.Format ("Firsts: Ad\n", m_FirstChars);
TRACE(display);
out << display;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            display.Format("Rex: %s\n",m_Rex);
TRACE(display);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            //
BOOL CHEA::ButMatch(LPCTSTR buf, int size)
                                                                                                                                        m_blantda • TRUE;
continue;
        while (PedGetState (580, 581, 587))
                                                                            it (sy -- SMBOL LAMBOA)
                                                                                                                                                                                                                                                                         Add($1,60,5y);
                                                                                                                                                                                                                                                                                                                                          Add (50, 81, 5y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          extern Distance soundDistance;
                                                                                                                                                                                                                                         it (ERemerse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CScring display:
unsigned s0, s1, sy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     int len;
LPCTSTR p * buf;
                                                                                                                                                                                                                                                                                                                                                                          )
m_Rex • pPex;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 out « display;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #ifrdef DLL_BUILD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          #ifratef DIA_BUILD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           #erdif
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Page 5 of 7

```
int next_state * (int) buf_state(Buf_i+1);
LACTSTR next_buf * STATE_BUF(next_state); // &state_offsets(
                                                                                                                                                                                                                                                                                                                                                                                                                                     if SubBurbatchkalki state_offsets, next_buf,
m_state[ThisState].m_ahrans[This_i].next.
next_state])
return TRUE;
                                                                          if ( int) buf_state[Buf_i+1] ** -1 )// found Buf Filbt.
                                                                                                                              // Substring match - any end point returns true return FALSE;
// so go no further
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sl * nfa.m_states[state].m_afrans[trans].next + m_KaxState;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for ( int trans=0; trans < nfa.m_states(state).GetSize(); trans++ )
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // This function inserts on state table into another. This creates a backward // flowing State table so it currently can't be used in a more search. The name // search routine should be mainfied to allow these kinds of tables
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if ( nfa.m_states(state).m_afrans(trans|.next ** FIRML )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sy = nfa.m_states(state).m_aTrans(trans).symbol;
                                                                                                                                                                                                                                                                                                                                                                                           if (next_state >= 0·)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for( int state*0; state < nfa.m_states.GetSize(); state**)</pre>
)
alse // more This path to go
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               s0 . state . m_MaxState;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      return FALSE; // didn't get out of this state
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AddToFirstChars(sy);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BOOL Cifa::InsertMfa(int start, int stop, Cifa& nfa)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ) // endif ThisChar=-BufChar
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AddToLastChars (sy);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if ( state -- 0 )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               continue;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TCHAR s0,s1,sy;
m_MaxState = m_states.GetSize();
                                                                                                                                                                                                                                                                                                                                       => (int)state_of(sets[i+1] ]; .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (int) (m_states(ThisState).m_aTruns(This_i).next) ** -1 )// found This Fl
                             if ( Buffagr -- ThisDar || Buffagr -- SNBOL_SIGN || Buffagr -- SNBOL_SIGN |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BOX, ORIA::Sabariwacawaikild/TSTR state_offsets, LKTSTR buf_state, TGBW ThisState, TGBW BufState!
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // the first terminated string in buf is firstchars
// skip the first chars
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // Advance the state in the buffer but not in the current infa
it { Subbuffetchalk( state_offers. STATE_BMF(state), 0, state ) }
//return( istate = 100/GatSite() );
return TUG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LASNFA.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ThisChar • (TCHAR) m_states(ThisState).m_aTrans(This_i).symbol;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for ( int This_i=0; This_i<m_states(ThisState).GetSize(); This_i++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tor ( inc Buf_i*0; Buf_i < (trans_count')); Buf_i** )
{</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BufChar . (TCHAR) buf_state(Buf_i-2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for (int state*0; state < state_count; state**)
{</pre>
                                                                                                                                                                                                                                                                                                                          ) return FMSE: // didn't get out of this state
                                                                                                                                                                                                                                         // endif ThisChar. BufChar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  int trans_count • (int) buf_state(0);
but_state **;
                                                                                                                                                                                                                                                                                                                                                                                                                           BOOL CHEE. SubButMatch (LECTSTR buf, int size) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         int state_count;
state_count = (int)buf[0];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LPCTSTR state_offsets . p.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TOTAR ThisChar, BufChar;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LPINSTR p = buf;
len = strlen(buf);
p -= len - 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        size -* len + 1;
len * strlen(p);
p -* len + 1;
size -* len + 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return FALSE;
```

// Substring sacch - any end point returns true return TRUE;

if (next\_state >= 0 ) . {

Page 6 of 7

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Page 7 of 7
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```
stream.put((dhar) s );
stream.put( (char) nfa.m_states[s].m_alrans(t].next );
stream.put( (unsigned char) nfa.m_states[s].m_alrans(t].symbol );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // write transition count before each list of transitions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        stream.put ( (char) nfa.m_states(s).m_aTrans.GetSize() );
                                                                                                                                                                                                                                                                                              int trans_count = nfs.m_states(s).m_aTrans.GetSize();
offset -- {((3*trans_count)*1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for ( t=0; c < nfa.m_states[s].m_aTrans.GetSize(); t++ )
{</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                  // now continue with the actual transitions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for( s=0; s<nfa.m_states.GetSize(); s++)
</pre>
                                                                                                                    // write offset to each state
for( offset = state_count.1, s=0;
sxnfa.m_states.GetSize(); s++)
// write number of states state_count = nfa.m_states.GetSize(); stream.put( (char) state_count );
                                                                                                                                                                                                                                            stream.put((char) offset);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           stream.put((char)254);
return stream;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // dan't walk if Otts nox valid or something intemped
// the Offs processing - check is an Extensel still necrosary
if (m_pcamet - FMLSP is fleshpry) - FMLSP)
// this is the first time through, so clear out the
// mandriants rotation. A lange check to see if
// this is first has the middared tidg est, which indicates
// that one of the possible variants is the empty string.
// That variant is not included in the state tables, so
// we must pick it off separately.
if (one - MML)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // The operator which actually writes a state table to a file or // string stream. Character 155 files's already in symbol is used // to 10 the Pabla state and character 154 is used as the record delimiter. In the tint to tolens in the record are zero delimicipal strings, the rest // of the record is the state table in 1 byte records.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             char Thisther;

for ( int i.o.) : a grates (state) .GetSize(); i.*) {
    Thisther * (char) m_states(state) .m_sthans(i).symbol;
                                                                                                                                                                                                                                                                                                                                                                        int Offer:LightStateTableTraversal(TOFAR state, char chr /* - MILL */ ) {
                                                                                                                                                                      // The method LightStateTableTawareal walks all the purbs // within the state table. It just course the makes of purbs, // and does not capture the variants that could be generated // The parameter dut is really just for recursion so it is defaulted // co NOLL for the first call
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        m_variants.Add("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        //
ostream& operator<< {ostream& stream, Offa& nfa}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return LightStateTableTraversal(0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                 mumVariants = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          numVariants • 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (m_blambda)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ONEa: : GetthmVariants ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 int s,t, offset;
int state_count #0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          recurn num/ariants;
                                                                     recurn TPUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                             static int
```

stream.put((char)0);
stream.write( nfa.m\_SourceName, nfa.m\_SourceName.GetLength() );
stream.put((char)0);

Add(s0, s1, sy); CString display; display.Format["41d: No-\n",s0,s1,sy); LASNFA.CPP 3-24-98 11:24a

stream.write( nfa.m\_FirstChars, nfa.m\_FirstChars.GetLength() );

ExtRism: \*tempExtRismel = new ExtRisme(nameString, editDistScore(0),

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Send the appropriate data to ranker

NAMERE 1 CPP 3-24-98 11:24a

```
i++) {
simCodeArray[namCodesAssigned] • (m_simpCodeVec[matchingRuleIndex])[1]
                                                                                                                                                                                                                                                                                                                                                                 /* Skip the in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (i < numCodesForThisRule) && (numCodesAssigned < lastA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              while (cord(index) is (namcodes/asigned + lastAssignableArrayIndex)) {
    index - FindBalectord, index, desEstEring, marchinghaleIndexes);
    marbillesErical, index, desEstEring, marchinghaleIndexes);
    for () = 0; } ranklingsEricals;
    for () = 0; } ranklingsEricals;
    // restringsBalectore, anatchingsBalectores assictingsBalectores assictingsBalectores;
    // restringsBalectore, anatchingsBalectores;
    // restringsBalectores;
    if (m.hales BarcchingsBalectores) output CostLorgth() := 0) {
        if (m.hales BarcchingsBalectores) output CostLorgth() := 0) {
            in copy the codes Irom the matchingsbalectores | w. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. purchase | m. pur
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    lastAssignableArrayIndex = codeArraySize - 1;
namCodesForThisRule;
                                                                                                                                up to rechraysize - 1 entries;
Raleset::GetSimplifieatOdeArrayPorString(LPCTSTR word, unsigned char *simCodeArray,
that describe the simplified code values for the name. We do this by applying the rules (just as we normally would) but branded of building a sering, we gimb the simplified codes for that rule.
The resulting array gots MLL terminated, so we only have space for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   same as GetSimplifiedCoxbeArrayPorString, except we build the simplified regex, rather than the encoded version RuleSet::GetSimplifiedRegexPorString(LACTSTR vort, CString sampMegEx)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  simplegEx - **;
vnile (wordindex) {
  index - findbale (word index, .GPEString, .functhingBaleIndexes)
  namblegEired - matchingbaleIndexes .size();
  for (int ) = 0; j < namblesEired - namblesEired; j++) {</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                matchingRuleIndex;
munCodesAssigned = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             matchingkuleIndex;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           i, j;
numRulesFired;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                numbulesFired;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               index • 1;
                                                                                                                                                                                                                                                                                                                                                                 index • 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   numCodesAssigned++;
                                                                                                                                                                                                                                    int codeArraySize)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // copy the
// building
for ( i • 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             vector.int> matchingRuleIndexes;
int
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         simCodeArray[numCodesAssigned] = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RetString;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return nurCodesAssigned;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ASSERT (word [0] ...' ');
                                                                                                                                                                                                                                                                                                  ASSERT(word[0] -- ');
CString
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * ssignableArrayIndex);
                                                                                                                                                                                                                                                                                                                                                                 int
-> itial blank */
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cstring
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // void
        :::::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /* Skip the an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  smatchingRuleIndexes);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // This is the method that is called to actually apply the rules
// to a new. The new must be delimated with spaces. The rule
// set defines space as the word boundry. Each letter of the word is
processed (from left to right). Nowever the function findbule!) could natch
// more than one letter so index is incremented and returned.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CString RuleSat::TranslateWord(LPCTSTR word, BOOL bRumoveSpaces/**TRUE*/)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         index - FindRule(word, index, &RetString);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             index * FindRule(word, index, &RetString,
// index++;
    Caprigit (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if ( bRunoveSpace's && word(index[**'') index**;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                while ( / index . strlen(word) */ word[index] )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // only phonology removes spaces if (word(index)**' ')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           mscchingRuleIndexes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ASSERT(word[0] *** ');
CString RetString;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        err << word << ",";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             //
| Bitrade Dil_BullD
| if (m_blogbules)
| err << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                "constander.h"
                                                                                                                                                                                                                                                                         finclude , "tds_util.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return RetString;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (m blayfules)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else
                                                                                                                                                                                                                                                                                                                                                                         #itdet CANSTIIDEX
#include "Profile."
#include "const!
Pendif
                                                                      Binchuse "ptiafk.h"
Binchuse "parze.h"
Binchuse "approx.h"
Binchuse «strotteam»
Extern ofstream eff.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // #itixlet DLL_BUILD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . itial blank "/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     using namepace std;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         antiklet Dil Billib
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // Nexdif
//
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Burnda f
```

PARSE CPP 3-24-98 11:24a

function to fill in an array of unsigned char (byte values)

Page 1 of 17

```
Check for context variables. The output of a rule can contain // variables like $1 meaning the first letter matched in the match // context this variable is simply replace by the letter before it // is attached to the output string. Otherwise the output is con-// cutuated as-is.
                                                                                                                                                                                                                                                                           // The main working method for the Raisfast class. Furbable() is passed
// an name locath and an index into it and it firsts a rule which passes
// all the contexts for that lamber (letter). The output is than added
// to the recum string parameter. If no rule is found for a letter than
// the lowerscale form of the letter is added to be recum string. The actual
// the lowerscale form of the letter is added to be recum string. The actual
// the lowerscale form of the letter is added to be recum string. The actual
// the context form of this routine. Interest replaced
// the context of the context portions of other rules. Since
// the canning of a ward proceed left to right only one match context of a rule
// applies to any letter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if( m_Rules(tule_index) .right.Match( &cord(remainder), &count ) )
; // do rest of the loop body
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else if( m_Rules[rule_index].match.Match(&word[index], &count ) )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    it( m_Riles(rule_index).left.LeftMatch(word, index, &count ) )
; // do rest of the loop body
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for (int rule_index=0; nule_index < m_Rules.size(); rule_index++ )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               int RuleSet::FindRule(LPCTSTR word, int index, CString *pRetString )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 matched_part * &word(index);
matched_part * matched_part.left(count);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (:remainder >= strlen(word) )
    remainder == strlen(word)-1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if ( m_Rules(rule_index).match.m_bLumbda )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 remainder * index + count;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DMstchedhull - TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         remainder = index;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PMatchedbull - FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BCOL DMatchedaull - FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ASSERT (m_Rules.size()>0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  continue;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              continue;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          continue;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ostring matched part;
Int count, remainder;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               extern ofstream err;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else
```

'pRetString +\* m Rules (rule index) .output.Left (pos) ;
'pRetString +\* m witched part [ilbg-1];
'pRetString +\* m Rules (rule index) .output.Nid(pos+2);

return remainder;

teg. Pornet (\*\$td\*, iTpg); pos = m Rules Intle\_index( .output. Pird(teg); if (pos == -1) break;

AdversageBox('in else');
if its, pos
Cotring Legs
for ( insg-1, insg - matched part GetLength(); insg--)

if( strdut(a\_Rules(rule\_index).output, '\$') \*\* NJL )
'pRetString \*\* a\_Rules(rule\_index).output;

else

PARSE.CPP 3-24-98 11:24a

```
vector int *matchingR
                                                                                                                                                                                                                                                                                                 how many characters matched wh
                                                                                                                                                                                                                                                                                                                                                                   of the word is left after the current rule is applied torpMatchCount = 0; // temp variable used to pass to leftMatc
does the natch context match MULL
                                                                                                                                                                                                                                                                                                                              that the match contexted matched.
                                                                                                                                                                                                                                                                                       Dwatchedhull * FALSE; //
                                                                                                                                                                                                                                                                                                                                       renainder;
                                                                                                                                                                                                                                                                                                                                                a that represents how much more
                                                                                                                                                                                                                                                                    ASSERT(m_Rules.size()>0);
                                                                                                                                                                                                                                                                                                                          . ;
                                                                                                                                                                                                                                                  extern ofstream err;
                                                                                                                                                                                                                                                                                                                                                                   >
                                                                                                                                                                                                                               •> uleIndexVector)
                                                                                                                                                                                                                                                                                                                                                                              inc
                                                                                                                                                                                                                                                                                                          .> en determining
```

Page 2 of 17

```
portio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if we actually ate up a character, we are done, so break the l
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                If we matched without eating a character, keep looking for a r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // if we are here, we applied a rule, so note which one was used
matchingshuleIndexVector->push_back(ruleIndex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     *pRetString ** m. Rules [nuleIndex] .cutput .left (pos);
*pRetString ** matchedPortion[ilag-1];
*pRetString ** m. Rules [nuleIndex] .cutput .Wid (pos-2);
                                                                                                                                                                                        netchedPortion = &eard(wordindex);
netchedPortion = metchedPortion.Left(metchCharCount);
for ( iTbg-1; iTbg <= metchedPortion.GetLergth(); iTbg <> )
                                                                                                                                                                                                                                                                                                                            tag.Format(*$1d*,iTag);
pos = m_Ralies[nule:index].output.Fird(tag);
if (pos == -1)
bresk;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // Peased a rule line from the input file, this function paraes
// the line and cheep for some basic errors. Finally it creates
// a rule object and adds it to the array. The output stream err
// is the error log and is opened in Outpup opp. This is a simple
// is prementation of the rule grammar if the rules become none complicated
// an actual grammar generator like yact! should be used.
in iTag, pos;
String tag;
String matchedPortion;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // if we could not find a rule that are a character just 
// copy the character (lowersead) to the return string and 
a shance the remainder to the next character in the word. 
if (toundbultTheteoDaracter == false) 
if paisting to colower(word(wordIndex)); 
remainder = word(mbdx + i).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             int nCount = 0, nPos, nitem = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BOOL RuleSet::AddRule(CString strList)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CString strSaveLine(strList);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CString delims(" \t");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         extern ofstream err;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BOOL DRet = TRUE;
BOOL D1,D2,D3,D4;
D1=b2=b3*b4*FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           note how many characters were eaten up by the match context match. and increment the remainder by that much. We will return the remainde
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 I think this code will be a problem if the word is not padded at the e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           becomes 1, which is equal to strlen(word). The remainder then gets se
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (m_Rales[ruleIndex].right.MotoN(semainder], tempdatchCount]) {

// we have found a rule that matches all three contexts, so

// append the rule's output portion to the pRefString variable.

// Check for concert variables, The output of a rule can contain

// variables like $\frac{1}{2}$ meaning the first letter watched in the match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   context this variable is simply replace by the letter before i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a space (it currently is). Consider a single character word that matc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     character. When the function comes it, the index is 0, and the remain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  to 0 by the conditional code, which would put us into an infinite loop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     is attached to the output string. Otherwise the output is con
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /// at the end of the function. The remainder is also needed so that we 
/// xow where to begin the right context nucli. 
remainder a worldhook a net-off-ant-fount;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // carinated as-is.
if (m_Rales [ruleIndex], getCoesOutputContainContext() ** false)
*pRetString ** m_Rales [ruleIndex].output;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        always calling this function looking at the first character.
                                                                                                                                                                                                                   clear our vector that holds the index of the rules that are fired during this call function.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (m_Rules(ruleIndex).match.Match(&word(wordIndex), &matchCharCount)) (
                                                                                       care about the member of matching chars in these cases
             when matching the left and right contexts. We do not
                                                                                                                                                                                                                                                                                                                                                               // noce that we have not found a rule to eat up the character(s) at the // bugginting of the portion of the word we are looking at. foundainthacked/brancer • false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // loop through rules, looking for one to use
for (int ruleIndax + 0; ruleIndax + m_Rules.size(); ruleIndax++)
PMICOPEALL1 FALSE;
ruleGibarComt + 0;
                                                                                                                                                         wordlen . strlen(word);
                                                                                                                      foundful eThat AtteAcharacter;
                                                                                                                                                                                                                                                                                                  matchingRuleIndexYector-~clear();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    *> 1rd with
                                                                                                                               15 E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      t hes 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ao der
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PARSE.CPP 3-24-98 11:24a

Page 3 of 17

```
err << 'LIDE: ' <= m_line << ' ' << (LECTEN) striaweline << erdl; err << ' Output has Binary operator | without parenthesis ' << erdl; ther - FALSE.
                                                                                                                                                                                                                          err c. 'LibE: ' cc m line cc ' cc (L#GTSR) strSaveLine cc endl;
err cc' Unbalanced brackets ' cc endl;
brec - FALE:
                                                                                   err «« 'nnB: " «« n_lins «« " " « « (lèrism) sirsàvelins « erd);
err « " trialared parentheis " « erd);
bet » PAIS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        this is a NILDE. The rules define silent as () sometimes.

However, () is not a valid regular expression, either by itself or when used as part of a larger regular expression. We therefore have special code to translate it to an entry string.

Name special code to translate it to an entry string in this seeds to have some sort of token for each output string, rules seeds to have some sort of token for each output string, and a Mill. work work (MILL is not a token). In alternative to this RILDE is to:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Replace the '()' in the rules with MAIL (''). Then either changed the code that reads in the simplified rules to ver off of position instead of todens, or assign a special codes for salest (just in the simplified rules).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 err ‹‹ 'LDE: ' ‹‹ m_line ‹‹ '' ' ‹‹ (LACISTR) strSaveLine ‹‹ entl.;
err ‹‹ ' Problem with regular expression ' ‹‹ entl.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Page 4 of 17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // no need to go on if there's an error if (thRet)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ) // further syntax checking on 4 columns
                                                                                                                                                                                                                                                                                                                                                                                                                               if (has or 64 thas peren)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   output ...;
Rule rule(left,match,right,output);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 m_Rules.push_back( rule );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            recurn bket;
                                                                                                                                                                                                                                                                                                                                                                          if ( check == 3 )
                                                                                                                                                                                                                      if (bracket : • 0)
                                                     if (paren :- 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DRet - FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        m_bCompiled = FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // chang
// vork
// token
if (output ** *()*)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (rule.m_Bad)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RuleSet:: 'RuleSet()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return blet,
                                                                                                                                                                                                                          poitch (nCounte.)

outch (nCounte.)

case 0: 11 (1CheckSympolistricem, lest 1) liber-Fhliss; bi-lebet; break;

case 1): 11 (1CheckSympolistricem, ncm. piber-Fhliss; bi-lebet; break;

case 1): 11 (1CheckSympolistricem, ncm. piber-Fhliss; bi-lebet; break;

case 1): 11 (1CheckSympolistricem, ncm. piber-Fhliss; bi-lebet; break;

case 1): 11 (1CheckSympolistricem, ncm. ncm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PARSE.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         err << "LDE: " << m_line << " . << (LPCTSTR) strEaveLine << errdl; err << " Problem with left portion of rule " << errdl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               err << *[.116: " << m_line << ' ' << (LPCTSTR) strSaveLine << erdl; err << " proolem with right portion of rule " << erdl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  err << "LHE: " << m_line << '' << (LPCTSTR) strsawbine << erdl; err << '' Problem with output portion of rule " << erdl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            err << "LLME: " << m_line << '' << (LPCTSTR)strSaveLine << erdl;
err << '' Problem with match portion of rule " << erdl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                case ('('): paren++; has paren = TRUE: break;
case ('['): bracket++; break;
                                                                             it ( nbos = striist.PirdOneOf(delins)) >= 0 )
stritem = striist.Left(nbos);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        int parenio, bracket-0;
BOOL has or-fALSE, has parenifALSE;
while ('p)
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // Check for further syntax errors switch(check)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for (int check=0; check < 4; check++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // no need to go on if theres an error if (!DRet)
                                                                                                                                                                                                                                                                                                                                                                   }
scrist = strist.Mid(nPos+1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        case 0: p = left; break;
case 1: p = match; break;
case 2: p = right; break;
case 3: p = output; break;
                                                                                                                                                                    strittem - stribist; .
while ( nCount <4 ) { // 4 items
strList.TrimLeft();</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           switch(*p)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    return bRet;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LECTSTR p:
                                                                                                                                                   else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (£ (1p3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (E) 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1f (1b1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (E (:b2)
```

case (')'): paren--; break; case (')'): bracket--; break; case (')'): has\_or = TRUE;

> Couring striken: Couring left, match, right, output;

```
err << "LINE: " << m_line << "Mis-placed \"{}\" in " << (LPCISTR) target << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                err << "LiNE: " << m_line << " " << (LACISTR) symbolizine << endl;
err << "Missing second quote after SE" << endl;
/// white space, we will get confused with the embathed shitespace that white space is written.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (Date == FALSE) {
    err << "LLNG: ' << m_line << ' ' << (LPCTSTR) symbolidine << erd!;
    err << "Invalid SET syntax" << erdl;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // This function searches a Citring object to see if it contains any embodied // spinolar, a spinol is embodied in a string unity the fill-dimeters. This is a simple implementation of the rule grammar if the rules become // finis is a simple implementation of the rule grammar if the rules become // more complicated an actual grammar generator (like yacc) should be used.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           err << "LiNE: " << m_line << endl;
err << "Missing ')' in " << (LPCISTR) target << endl;
bRec - FALSS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // make sure we have a symbol. The value can be empty if (symbol [0] != 805] { AddSymbol (symbol, value);
                                                                                                                                                                                                            // grab everything between the quotes value[an * (end)cotektr • value[ar) • 1; etmppy(value, value[tr + 1, value[an); value[an]) * 825;
                                                                                            if ((*valuePtr) == '\*')
dbar *endQuotePtr = strdhr(valuePtr + 1, '\*');
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (
valueten - strespolvalueter, delins);
strncpy(value, valueter);
value(valueten) = ESS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BOOL RuleSet::CheckSubSymbol (CString target, CString& RetString)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (( rpos = target.Find('}') ) == -1 )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               int lpos,rpos;
while ( ! lpos = target.Pind('{'}) != -1 )
                                                                                                                                                                                            if (end)uotePtr !- NILL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             bRet - TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if ( rpos <= lpos )
                                                                                                                                                                                                                                                                                                                                                            else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      extern ofstream err;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RetString - target;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BOOL bilet - TRUE;
Ostering compstering;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      return bRet;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          assume false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               valuePtr - syntolPtr : syntolLen;

valuePtr - syntolPtr : syntolLen;

// corpy the value into a separate buffer

// fire value could be a quoted value (possibly with enchander spaces),

fire value could be a quoted value (possibly with enchander spaces),

or a single string value (intout spaces). We must therefore see it

// was a single string value (intout spaces). He must therefore see it

// was a single string value (without spaces).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               value starts just past the SET.

// get rid of leading whitespace
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      since we already stipped this before we care into the function, the first white space is the white space between the SST and the spreol. We have already checked for the set, so we can begin at the fourth character.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // This method parses a Sot command from the input file and adds the symbol to the Symbol map. A part command is imply three columns delimited // by white space. Set everiable names "estring"s. This is a simple implementation of the tule grammer if the nules become more complicated // an actual grammer generator (like yace) should be used.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // and a symbol manually from the two parameters. This function can // be used to hard code symbols into the rule set. Currently all symbols // are added from the rule sets.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          bRet = FALSE;

*delims = " \t";

symbol [MOX_SYMBOL_LEN + 1];

value [MAX_VALUE_LEN + 1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               symbolien;
valueien;
whitespaceien;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     void RuleSet::AddSymbol (LPCTSTR name, LPCTSTR value)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   pymtolptr = symboliina + 3;

whitespacelon = strspm(symbolPtr, delims);
symbolPtr -= whitespacelon;
symbollen = strcspm(symbolPtr, delims);
                                                                                                                                                                                                                        // reset the RuleSet so that it can be re-used
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  //
BOOL RuleSet::AddSymbol (LPCTSTR symbolLine)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CString tmp * name;
tmp.MakeUpper();
m_symbols(tmp) * value;
                                                                                                                                                                                                                                                                                                                                                                m_kules.clear();
m_symbols.clear();
m_bCompiled * FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (symbollen > 0)
                                                                                                                                                                                                                                                                                                    void RuleSet::RemoveAll()
                                                                                                m_Bad - FALSE;
                                Rule:: "Rule()
{
```

PARSE.CPP 3-24-98 11:24a

Page 5 of 17

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chap off everything pa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (rulestitaineaut := BGS) {
   if (_stringoficalesfilaineaut, "set", 3) -= 0) if
   ((_stringoficalesfilaineaut, "set", 3) -= 0) if
   ((_stringoficalesfilaineaut, 3) -= 0) if (rulesfilaineaut, 3) -= 0)
                    // This is the Method which actually reads the rule set from the file into // memory. Reading a line at a time if destrictes the line type fact or rule) // and rolls the appropriate member function to add the rule or spectol. This is // a simple implementation of the rule grammar if the rules become more complicated // an actual grammar generator (like yaco) should be used. //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               bRet • AddSymbol (rulesFileLineBuf);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              while (in.getline(rulesFiledineBuf, WAX_RULES_FILE_LUNE))
semiColonPtr - strchr(rulesFileLineBuf, ':');
if (semiColonPtr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    bRet • AddRule(rulesFileLineBuf);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ifercom initiatis, ioscin);

if (in || in bad() |

err <- reviblem with imput file * << infile << end);

err <- (close);

err <- (close);

bet * FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // open the error.
if (lerris goan))
if (lerris goan))
if (lerris goan))
if (lerris goan)
Achesagebx('Cond not open error log file: Error.Log');
                                                                                                                                                                                                                                                                        bRet = TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ( certical computing " << infile << endl;
err << "Reading rules from file " << infile << endl;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CString striame, stritem;
CString left, match, right, output;
rulesfileLineBut(MAX_EULES_FILE_LINE • 1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 semiColonPtr = DOS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tds_strip(rulesFileLineBuf);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if ( m_Rules.size() <= 0 )
                                                                                                                                                                                                                                                                                                                                                                                                                                     infile - m_RulesFile;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            m line . 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RemoveAl1();
                                                                                                                                                                                                                                                    extern ofstream err;
BXXL
char
                                                                                                                                                                                                                                                                                                                                                 m_bCompiled . FALSE,
                                                                                                                                                                                                                                                                                                                                                                                                          if (infile--MLL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; ; d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       · · · /c.)}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               *> St ';
                                                                                                                                                                                                                     removed by EFB. We should treat salests as nothing. If we leave the code below in the SPBCL_index character vill end up being part of code below in, the SPBCL_index character is since the organ code treats it as just a regular operation that co
                                                                                          err «« "LRE: " «« m_line «« " Symbol not found: " «« (LPCISTR)Symbol «« endi;
bet « PALSE;
                                                                                                                                                                                                                                                                                                                                                               (ASCII 5) becomes part of all the variants).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      err c. 'LibE: " ccm_lips cc 'Problem with column' err cc' is there a space in a column' cc erdl; return PALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // a quoted string
if (str.ksght()) -- "\" )
if (str.ksght()) -- "\" )
return Quecksabsymbol (str.Hid(), len.2), newStr);
''n= «c *Problem str column
''n= «c *Problem str column
' -- «c *Problem str column
' -- «c *Problem str column
                                                                                                                                                                                                                                                                                                                                                                                      if (tmpString.lsBmpty())
tmpString = (unsigned char)SYMBOL LAMBDA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // This method does the actual lookup and returns the string represented \ensuremath{//} by the symbol
Cutring Symool = target.Wid(lpost,(trpos-lpos)-1);
ResString = target.Left(lpos);
if ( :CheckSymool (Symbol, urpString) )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // if not quoted string than make upper to check for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BOJL RuleSet.:CheckSymbol (Cstring str. Cstrings newStr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 }

// Acd it anyway
RetString ** tryString;
RetString ** target.Mid(tpos*1);
target ** RetString;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              symbols_map_t::iterator symbollt;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   symbolic * m_symbols.find(str);
if (symbolit ** m_symbols.end())
return FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            int len = str.GetLength();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if ( str.IsBmty() )
return FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    newStr = Str;
str,Trimleft();
str,TrimRight();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               str.MakeUpper();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          }
return blut;
                                                                                                                                                                                                                                                                                                                                       e de
```

return TRUE;

bRec - PALSE; break;

PARSE CPP 3-24-98 11:24a

newStr = (\*symbolit).second;

Page 6 of 17

```
err << 'No rules found in file;" << endl;
bRet + PALSE;
```

// the first char bi line(the word being translated) must be space
// the Spillar function is passed the buffer pointer : 1
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Ca

line.ReleaseBuffer(); line.MakeUpper(); line += '';

// test code //ofstrems.ips\_out(\*jpalist.out"); //if (ips\_out.bad()) // return 0;

| when to close the err file him. He's lowe it open so we | // can include error logs while the names are being translated | // can include error logs while the names are being translated | // can include error logs while the names are being translated | // can include error logs while the names are being translated | // can include error logs while the can log of

etastic int reclarationed 0;
static int randomescopiuled 0;
static int randomescopiuled 0;
static int randomescopiuled 0;
static int randomescopiuled 0;
static int randomescopiuled 0;
static int postorial int postorial int postorial int postorial int postorial int postorial int postorial int postorial int postorial interpretation int postorial interpretation inter

PARSE.CPP 3-24-98 11:24a

```
contempor = TRUE;

for (subleych = 0.1; -subleych |= BRS; subleych++) {

if (15 VorEz: +subleych) == FMLSB) {

// was not a vorez, so check to see if it
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         check to see if next churacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /// found a i, so look for the closing ].

Along the way, make sure each character is a vowel.

/// if net, we can not discount this subexpression
subdepressionStar = ch;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // remove that too
if (*(subSqCh + 1) == '?')
ch = subBqCh + 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // ), ?
if (*subEqch == ')') {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                expressionChanged • FALSE;
stropy(tempforocaleRex, derocaleRex);
for (ch - tempforocaleRex, ch := EDS; ch++) {
   if (ch == (') {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // keep reducing till we have reduced all we can while (expressionChanged) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else
                                                                                                                                                                                                                                                                                                                                                                             // copy the rex Cirring to our string
// each pass of our for loop will copy
// trun temptorocaledax to decomeledax
// just before the loop, we copy the rebuit
// of the last pass into temptorocaledian.
strip/decompledax, rexy;
// keep reducing till we have reduced all we can
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         :
                                                                                                                                                                                                                                                                                                                    expressionChanged - TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  skip past entire subexpression plus the ?
                                                                                                                                          devoweledRex(1000);
tempDevoweledRex(1000);
                                                                                                                                                                                                                                           subExpressionStart;
CString rex • TranslateWord(line);
                                                                     nfa.m_SourceName = line;
if (bTextOnly)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              s) just skip past the subexpression
                                                                                                                                              char
char
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       end of subexpression
                                             Oufa nfa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -> is a ?. if so
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -> 18 &
```

Page 7 of 17

```
expressionCharged • TRUE;

// we can remove this subexpression, but check to
// see if a { symbol is either before or after th
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           not part of any subexpression that we can elim
                                      must be a consonant or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                output the (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               skip past
                                                                                                                                                                                                                                                                                                                                                                                                                                            // If so, we need to remove that as well.
if (subExpressionStart != devoweledRex) (
                                                                                                                                                                                                  if (*subbqc) == BOS) {
ALAMESSAGEBOX("Found BOS in subexpression");
ALAMESSAGEBOX("EX);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       inta.Set(rex);
num'ariants - rid.GetMum'ariants();
num'ariants - rid.GetMum'ariants();
lue first line to include the comm name. Second line
// tor just the IPA
// tor just the IPA
// co. (IACTER)line < * * * < (IACTER)| rex < end;
// out << (IACTER)| rex < end;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       terminate the string
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              just trim the right side of the line, since we want to knep
the leading space. We will just subtract I from strien to
account for that leading space.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               it (*(ch · 1) -- '|')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          outCh--;
E ~
                                                                                                                                                                                                                                                                         >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  · (out@·+) • · dh;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             and move back 1 so we will overwrite it.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      wipe it out (we should not really have to do this)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cemplen = strlen(line) - 1;
rexLengthTotal -= strlen(rex);
nameLengthTotal -= templen;
if (templen > longestWameLen)
                                                                                                                                                                                                                                                                                                                                                     else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                )
rex.Releasubutter();
*outCh * EOS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   don't check before start of rex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       rex.TrimLett();
rex.TrimRight();
// just trim
// the leadin
                                                                                                                                                                                                                                                                                                                                                                                                                               ., e subexpression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   :
:
                                                                                                                                                                                                                                                                                                                   · the (
                                                                                                                                                                                                                                                                                                                                                   we can remove this subexpression, but check to see if a | symbol is either before or after th
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             must be a consonant or the sta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      - updragns.) | (.|. -- updragns.)) ji
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       check to see if next charact
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (*(subExpressionStart - 1) ** '|') {
    *outCh * EOS;
//
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 skip past
                                                                                                                                                                                                                                                                                                                                                                                                            // If so, we need to remove that as well.
if (subExpressionStart !* deroweledRex) {
                                                                                                                                                | (*subsych -- DS) | Arbessychoston');
| Arbessychor("found BXS in subsychoston");
| Arbessychor("rex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // remove that too
if (*(subEqCh + 1) ** '?')
ch • subEqCh + 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              it (*subBapCh == ')') (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             it (*(cn - 1) - *(1) - {
                                                                                                                                                                                                                                                                                                                                       expressionChanged = TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                - '
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     >
                                                                                                                                                                                                                         )
if (canRemove == FALSE) (
    *(outCh++) = *ch;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             and maye back 1 so we will overwrite it.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       skip part entire aubapression plus the ?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        . wife it out (we should not really have to do this)
                                                                                                                                                                                                                                                                                                )
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                   don't check before start of nex

    just skip past the subexpression

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .. erd of subexpression
                                      .. rt of an embedded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         es is a ?. if so
                                                                                                                                                                                                                                                                                                                                                                                                 .. e suboppression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    . an OR | symbol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "
                                                                                                                                                                                                                                                                                     · the (
                                                                                                                                                                                                                                                                                                                                                                                                                                                     // ::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . 15 d
```

continue;

// { and ? can be ignored

} (1.2. - -

- F

PARSE.CPP 3-24-98 11:24a

Page 8 of 17

```
pos • p_dlg.SerPos( (((loxg)in.tellg()) • 100) / status.m_size );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // This method is used in the Test phase of the application. In-order to see whether // a hit could be got from a detabase, then votants of regular expressions) are // generated for both the Query mene and the database near. Then the state tables are // compared for a match. This is the seme thing that is done in an actual newsearch // however here we are not actually writing anything to disk. The output stream defined
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 out cc -Average number of variants is " cc (float)nuvVariantsAvg cc end); out cc -Biggest number of variants is " cc (float)biggesthanVariants cc end);
                                                                                                                                                                                              if (Dobby) nia.m_Sourcelane = nia.m_Sourcelane + ';" + rex .nia.Sec(rex);
out <= nia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       realenkog = (float)rexidengthTotal / (float)numNemesCompiled;
numsLeukog = (float)namsLeugthTotal / (float)numNemesCompiled;
numNemiantskog = (float)totalbumVariants / (float)numNemesCompiled;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for (int i=0; i< nfa.m.variants.GetSize(); i++)
ipa_out << nfa.m.variants(i) << '\0' << li>line << endl;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      err << "Compile was Cancelled;" << endl;
return FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AcomesageBox (errmog);
sprint (errmog, "longest name len is 1d", longestNameLen);
AcomesageBox (errmog);
tocalbumVariants « numVariants;
if (numVariants » biggestNamVariants)
biggestNamVariants « numVariants;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sprint(errmsg, "Average regex len is \ff", rexLenAvg);
AfxMessageBcx(errmsg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sprint(errmsg, "Average name len is \( \mathbf{l}'', nameLenAvg);
AtaMessageBox (errmsg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if ( p_dlg.CheckCancelButton() )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        #ifdef CANUTIENES

if ( line_count ++ V 50 == 0 )

{
                                                                                                                                                                                                                                                                                                                                                                                                                             audt
CString str:
nfa.m_variants.RemoveAll();
nfa.Walk(0,str);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            errmsg[1000];
                                                                                                                                                                                                                                                                                                                                                                // rest code
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           float
float
float
char
                                                                                                                                                                                                                                                                                                                                                                                                    Hitchet DEBUG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #end1
```

PARSE CPP 3-24-98 11:24a

```
varIndex;
longestVariantForThisRegex
templength;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               numVariantsForThisRegex;
numVariantsPossEquivRegex;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unsigned chars registrobeter;
vector to hold the distribut replacement strtings as a vector,
so that we can reference then via the II operator. It is just
a copy of the replacements set, as a vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  If (m_bCompiled == TRUE)

sec-CST:ingy = Traphenement = getDistinctReplacementStrings();
sec-CST:ingy =: iterator replacementSetIter;
sec-CST:ingy =: iterator replacementSetIter;
unsigned char = mextAnniCode == 1;
unsigned char = codePorThisRepSx;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            BOOL b = nfal.Buffatch((LPCTSTR)stream.str(), stream.pcount()-1); stream.rdbuf()->free:e(0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   function to encode the rules by determining the unique set of tipplacement repeats, and assigning a unique scote to each one regact that are equivalent are given the same code. The function makes sure that the rules have already been compiled. Blacket: Shocodehiaes (800). Buildeder: Shocodehiaes (800).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          replacementNfa;
possEquivNfa;
                                                                                                                                                                                                                                                                                                                                          ostrstream stream(buffer,LBRTH, ios::binary|ios::out);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         longest Var Vec;
                                                                                                                                                                                                                                           nfal.Set ( TranslateWord( nl ) );
                                                                                                                                                                                                                                                                                        nfa2.Set ( TranslateWord( n2 ) );
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         vector-unsigned char-
                                                                 CString nl . . ., n2 . . .;
nl . e. namel;
nl . e. namel;
nl . e. .,
nl . e. .;
nl . e. .;
Clfa nfal, nfal;
                                                                                                                                                                                                                                                                                                                                                                                          // stream << binary; stream << nfa2;
const int LENGTH * 1024;
char buffer(LENGTH);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         vector (int)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CString
int
int
int
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return b;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BOOL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      : : : : X
```

Essentially we are compiling Although we could compare citing it to the stream and as the name search, making this

// here is a string based stream (instead of a file based ons). En // a database of one name (in second) and obtaing a query on it. Ald // the compiled Offs object citrectly we don't. Instead, by virting // drecking the stream we are uning the coact same functions as the .// function a good test of the name search.

> longestNumèlen • temple numtkmesCompiled••;

BOOL RuleSet::NameMatch(LPCISTR name1, LPCISTR name2)

Page 9 of 17

replacementRegScStringPtrVec.clear();

```
// TODE, it reads every variant.
// possibility/file, or by are the same.
if (CoundescriberThinkariant as TODE) {
    since they are the same, we assign a code that is the
// same as the ordinal position of the item we were compa
//
                                                                                                                                                   fourdatchforthis/ariant = FALSE;
for (int_innerhatchindex = 0; innerhatchindex < numberiantsPos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                after the above nested for loops, the variable foundhatchForTh
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            should be FALSE if the NFAs are not equivalent. If the variab
BOOL foundmetchPorThisVariant; for (int outerMetchIndex \epsilon numVariantsPossByzivNe for (int outerMetchIndex = 0; outerMetchIndex
                                                                                                                                                                                                                                                                                                if (replacementNfa.m_variants(outerMatchindex) -- poss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 went all the way through the inner (possEquivMfa) NFA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             find the variant from the outer (replacementata) NFA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | save a pointer to the replacement string for this code. This weter is included by the code, so that the string at the say, third item is the string for code 1. This works, because we |// push a black coto the vector at the beginning since vectors are |// push a black coto the vector at the beginning since vectors are |// o indexed, and the codes start at 1. O indexed and the codes start at 1. O indexed and the codes start at 2. O indexed and the codes start at 2. O indexed and the codes start at 2. O indexed and the codes start at 3. O indexed and the codes start at 3. O indexed and the codes start at 3. O indexed and the codes start at 3. O indexed and the codes start at 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. O indexed and 3. 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          since we did not assign it.
                                                                                                                                                                                                                                                                                                                                                                                                   foundWatchForThisVariant . TRIE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          codeForThisRegEx = regExCoxleVec [vecIndex];
isSame = TRUE;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (foundbatchForThisVariant .. FALSE) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // was not the same, so assign it the next available code,
// and bump up the next avail code variable.
if (isSame == FALSE) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  now we have a vector of regexes - replacementRegExStringPtrVec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and a parallell vector of regax codes - registrokelec.

we use these to plack to original rudes in the rules set and assign the regax code to the nutescen's member variable m_registrokelec. This is necessary because the variable m_registrokelec. This is necessary because the large is not in the same noter a to the rules in the rule set. We use the replacement/ge/Scrimpkrive to find the rule we are looking for, and thon assign
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               it to (vecIndex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            regExCodeVec. push_back (codeForThisRegEx);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                m_numDistinctCodes - nextAvailCode - 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            _ >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            vecIndex++;
                                                                                                                                                                                                                                                                                                                                                  e, EquivMta.m_variants(innerMatchIndex))
                                                                                                                                                                                                                                               ** sEquivRegex; innerMatchIndex**) (
                                                                                                        •> gex; outer/acchindex++) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -> so they are different
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ******
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         . and did not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       isVariant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -, le is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ering :
                                                                                                                                                                                                                                                                                                                                                                                                                                                    for (replacementSetiter * replacements->begin(); replacementSetiter (* replacements->end(); re
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     line below should be unnecessary, because we should already
know that the possible equivalent regular express has the
same number of variants as our candidate regex, numbariantsfor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (replacementSetIter2 = replacements->begin(); replacementSetIter2 != replacementSe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  is found in the variants generated by the resus of the specially equivalent regar the happens to have the same number of variants and the same max length.

Here that because they have the same number of variants, we only need to check in our direction. That is, we only need to check in our direction. That is, we only need to check in our direction.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   numVariantsPossEquivRegex = possEquivMfa.m_variants.GetSize();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   now we need to see if every variant from the new regex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |cementRegExStringPtrVec(vecIndex|);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         it (!longestVarVec(vecIndex) ==!ongestVariantForThisRegex) it
inamVarVec(vecIndex) == namVariantsForThisRegex))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IongestVariantPorthisDegox = 0;

for (variable = 0; variable x numbriantSPOrthisDegox, variable++)

tor (variable = 0; variable x numbriantSPOrthisDegox)

to (templemyth = iongestVariantPorthisDegox)

IongestVariantPorthisDegox = complemyth;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            replacementRegExStringPtrVec.push_back((LPCTSTR)*replacementSetIter);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  now see if this regex is actually the same as a regex we have already processed. If it is, it must have the same naries of variants and its longest variant must be the same langth as the other. We do these quick checks to avoid the costly offs processing the start of the loce but we only need to look from the start of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       numVariantsForThisRegex = replacementMa.m_variants.GetSize();
                  clear out our member variable that organizes the replacement strings by code. Also, push a damy black or MLL entry onto the vector so that the inflacing will match the 1 based acheme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // now see how many characters this regex can produce
replacementalia. RemoveAll();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               store the longest/ariantForthisRegex and
num/ariantsPorthisRegex values in our vectors.
this will help reduce the number of names we will
have to create 1878 for.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          longestVarVec.push_back(longestVariantForThisRegex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    With Walk (O, (1) unkstr);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           replacementMfa.Set(*replacementSetIter);
replacementMfa.Malk(0, junkStr);
                                                                                                                                                                                                    m_replacementRegExStringPtrVec.clear();
m_replacementRegExStringPtrVec.pumlback("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ivila. Set (rep!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                set to our current position.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            m_numDistinctStrings++;
                                                                                                                                                                                                                                                                                                                                                              m_numDistinctStrings + 0;
                                                                                                                                                               we use for codes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           => titer; replacementSetiter2++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .. placemantSet (ter···)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    • ThisRegex
```

Page 10 of 17

PARSE.CPP 3-24-98 11:24a

```
wetorkCitring> "variantsPorCode1 = genVariants(regDxCorCode1, FALSE, FALSE, 0, genVarRC); for (j+1;j\leftarrow m\_nnDistinctCodes,j\leftrightarrow)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      recCodeComparisonArray[i][j] - CalcRecCodeCompScore[j, variantsForCodel, &RecApprox];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (i == j) // recCodeComparisonArray is of floats recCodeComparisonArray[i][j] = 0.0; // 0.0 means that i and j have no differences
                                                                            rechdeOmparisonArray[1][j] • OalcRechdeOrr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // initialise the reconsciouparisonuray to all 1.0 for(1 * 0; 1 * 256; i+) for(1 * 0; 2 * 256; j+) reconsciouparisonuray[i][j] * 1.0; // 1.0 * default no match
                                                                                                                                                                                                                                                                                                                        // this is the new float version of this function // the isplicith to generate the RG comparison values will now // the based on the distributes score between the two RGDs instead // of the digraph analysis of the two RGDs
                        recondendentembrray(i)(j) - 100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     char errhog(1000);
sprint(errhog, "Could not find regEx for code td", i);
AlabessageDax(errhog);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WriteRecMatrixToFile(); // this writes the rec matrix file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // remember to go from 1 to numCodes inclusive, since
// codes begin at 1, noc 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             //atdomp << "The rematrix.bin file was not found\n"; 
// declare the Oppins object here 
Oppins Reckprox("floatdist.nul");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       //if(!matrixfile.good(!)
if (!matrixfile.good(!)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                //CFile matrixfile;
//char 'matrix_file_name * 'recmatrix.bin";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for(i = 1; i <= m_mamDistinctCodes; i++)</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // this function has exception handling
BOOL RuleSet::CreateCodeComparisonArray()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         regBuforCodel = GetRagBuforCode(i);
if (regBuforCodel == NUL)
                                                                                                           }
delete variantsPorCodel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ifstream matrixfile("recmatrix.bin");
if (i = 3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tds_vargen_code_genVarRC;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BOOL rc • TRUE;
const char *regExPorCode1;
int i.j;
                                                                                                                                                                                                                          return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                wertorkGitting 'variantsforGobl - genVariantsfregScForGobel, FMLSE, FMLSE, 0); for (int j+1; j e- m_nemDistinctGobes; j+i)
                                                                                                                                                                                                                                                                                                                                  char err#sg[1000];
**printf(err#sg, "Could not find regEx for code Nd", i);
ALXMessageBox(err#sg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   regus that are equivalent are given the same code. The function makes sure that the rules have already been compiled.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // now use the codes we just assigned to build the 
// table that says how closely two codes are related 
it (buildECOMPATRY) { Charles are related 
TableCOMPATRY ();
                                                                                                 clear out the previous values for m_regBoCodeVec
and set each value to 0;
          the REC to the d_regBaccdeVec at that position.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            function to enough the rules by determining the unique set of replacement regexs, and assigning a unique code to each one.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // remarker to go from 1 to numbbles inclusive, since
// codes begin at 1, not 0.
for (int i = 1; i <= m_numblistinctCodes; i++)
                                                                                                                                                                                                  regExForCodel = GetRegExForCode(i);
if (regExForCodel == NULL)
                                                          nambiles - m_Rules.size();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RuleSet::CreateCodeComparisonArray()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      char *regExForCodel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 delete replacements;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    rc . FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return re;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             _ <del>3</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
```

Page 11 of 17

PARSE.CPP 3-24-98 11:24a

```
if (i == j) // recCodeComparisonArray is of floats recCodeComparisonArray[i] [j] = 0.0; // 0.0 means that i and j have no differen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  recodeComparisonArray[i][j] • CalcRecCodeCompScore(j, variantsPorCode), sRecA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        vector-CString» "variantsPortOdes = genVariants(tregSuPortOde), FALSE, FALSE, 0); for (j = 1; j <= m_namDistinctCodes; j++)
                                                                                                                                                                                                                                                                                                                             char erreg(to00);
sprint(erres, "Could not find regix for code Nd", 1);
hressepsion(erres);
brak;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if ((recCode < 1) || (recCode > m_replacementRegBxStringPtrVec.size()))
return MJL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return (LACISTR)m_replacementRegExStringPtrVec[recCode];
// initialize the recook-comparisonarray to all 1.0 fortile 0; 1 < 256; 1+1 c 256; 1+1 recook-comparisonarray (1) (3) = 1.0; // 1.0 • default no match recook-comparisonarray(1) (3) = 1.0; // 1.0 • default no match
                                                                                                                                     // remember to go from 1 to nanoches inclusive, since // codes begin at 1, not 0.

for(i = 1; i <= m_nambistinctCodes; i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  function to search for the recode in our vector of recodes for these tudes, and return the corresponding regist string. Return NuLL if the code is not found that ' Buleser: GertRegistPortCode (int recOde)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            nambules = m_regboodeVec.size();
*returnCharPtr = NUL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for (int i = 0, i < numbles; i++) {
   if (n_regiscobleve(i) == recoble) {
      returnClarPtr = n_kales(i).output;
      break;</pre>
                                                                                                                                                                                                                                                                regExforCode1 - GetRegExPorCode(i);
if (regExForCode1 -- NJL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           //AtdessageBac('rec comparison matrix built');
//ordstream (_out('recontrix.cx');
//ordstream('out);
//Cout.close);
//AddressageBac('rec outrix damped');
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            delete variantsPorCodel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return returncharPtr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                int
const char
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  • > pprox);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       · · ces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PARSE.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //itstream matrixtile;
// for some reason the los::nocreate flag is not working
//matrixtile.opon("recmatrix.bin",los::binary,filebuf::sh_none);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ooid RuleSut::ReadRucMutrixFromFile(ifstream *matrixfile)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if(e->m_cause ** CFileException::fileMotFound)
afxLump << "The recratrix.bin file was not found\n"</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CFile macrixfile("recmatrix.bin", CFile::mcdeRead);
                                                                                                                                                                                                                                                                                                                                                                                                                       o_file << resCodeComparisonArray(i)(j) << entl; }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             natrixfile-sptline((dar*)buf,BUFSL2);
element = atof((const dar*)buf);
recCodeComparisonArray(i)[j] = element;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BOOL RuleSet::CreateCodeComparisonArray()
                                                                                                                                                                                                                                                                                                                                                                                       for(j * 0; j < m_numDistinctCodes; j**)</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       for() = 0; j < m_numDistinctCodes; j**)</pre>
                                                                                                                                                                                                                                                                                                    ofstream o_file("recmatrix.bin");
for(i = 0; i < m_namDistinctCodes; i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for(i * 0; i < m_mamDistinctCodes; i++)
          ReadRechatrixFromPile(Amatrixfile);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // declare the CApprox object here
                                                                                                                                                                                    oud RuleSet::WriteRecMatrixToPile()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       const. char *regExforCode1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             float element;
unsigned char buf(BUFSIZ);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CATCH (CFileException, e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   o_file.close();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B00L rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    int i.);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    int i.j.
                                                                                                                                                                                                                                                 int 1, );
```

Oppment Recomment ("floatedist.rul");

Page 12 of 17

```
variant2 * (LPCTSTD) (variantsPorCode2) (j):
    // here we should be calling the odit distance algorithm
    tempSore * edit distance_score((ussigned char *)variant),
    RecAgnrowFr;
    RecAgnrowFr;

                                                                                                                                                                                                                                                                                                                                                                              unsigned char digraph_score(const char *string), const char *string2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RecApproxPtr->rec_gen_float_differences(string1, string2, score);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A value from 0 to 100 is calculated based on the number of digraphs which match between the two given strings.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // commented out for your protection 
// We are not going to use the digraph method to calculate the 
// RBC comparison scores.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  float edit_distance_score(const unsigned char *string1,
const unsigned char *string2,
CAprox *RecAproxPtr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return returnScore;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              float score = 0.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  / digraph score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return score;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // now compare the variants in a cartesian product Gr/le to
// determine how close these expressions are.

for (int, i o) i i e numbranersDecodes; i++) {
    tor (int, i o) i e numbranersDecodes; i++) {
        terpSome = digraph_gone((variantsPecOde)[i]), ('variantsPecCode)[j]);
        if (rempSome > returnSome)
               *variantsPorCode1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // generate the variant for each for each code's regEx
vector<CString> 'variantsForCode2 = genVariants(regExPorCode2, FALSE, FALSE, 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PARSE.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          char etthog(1000);
sprint(letthog, "Could not Lind regDx for code 'A", code));
AlamissageDax(etthog);
                                                                                                                                                                                                                                                                                                                             char errNeg(1000);
sprintf(errNeg, "Could not find regEx for code 1d", code2);
ALAMessageBox(errNeg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // get the region for the second code, so we can compare them regionalcode? . GetRegionGade (codes) ;
                                                                                                                                                                                             // get the refers for the second code, so we can compare them rejectorodel * GetRegEuForCode(code);
//
unsigner that RuleSet :: CalcRecCodeCompScore (int. code), vector <CString>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        get the counts for the variant vectors
naviariantsPorCodel • variantsPorCodel->size();
narVariantsForCode2 • variantsForCode2->size();
                                                                                      regBcPorCode2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           float RuleSut::CalcRecCoAcCmpScoretint code2,
vector.CString> 'vc
CApprox *RecApproxPtr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // this is the float version bf this function
// it uses the edit distance algorithm to calculate the
// comparison value of two recs rather than the digraph
                                                                                                             returnScore • 0;
tempScore;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               delete variantsForCode2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        const char 'regExPorOde2;
float returnScore * 1.0;
float tempScore * 0.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (regExForCode2 -- NULL)
                                                                                                                                                                                                                                                                                                      it (regExForCode2 •• NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    const char "variant;;
const char "variant2;
tds_vargen_code genVarRC;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      return returnScore;
                                                                                                             ursigned short int
unsigned short int
                                                                                                                                                                                                                                                                                                                                                                                                                               )
else
                                                                                              Const
```

// generate the variant for each for each code's regRx vector<cStrings "variantsPurCode2" = genVariants(regExPorCode2, PALSE, PALSE, 0, genVarRC);

// now compare the variants in a carresian product style to
// determine how close these expressions are.
for (int i = 0; i < numWarlantsForOodel; i++)</pre>

if (tempScore < returnScore)
returnScore = tempScore;

delete variantsForCode2;

get the counts for the variant vectors nawVariantsPortCodel = variantsPortCodel -saize(); nawVariantsPortCodel = variantsPortCodel -saize();

Page 13 of 17

Each match results in two points being added to the total. The final score is the total marber of points divided by the number of digraphs that could have matched.

The routine ensures that a digraph can only participate in a

```
outfile << (LPCTSTN)outbuf;

// now see if the code has been assigned to rules with different
// strings. Since we do not want to repeat alias, we build a set
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (report/oce -- REFORT_MEDE_SENSE_ALL_RULES) {
    outlibe -- "REFORT_MEDE_SENSE_ALL_RULES) {
    outlibe -- "REFORT_MEDE_SENSE_ALL_RULES] {
    tor (intrinicities -0; rulesfires - runshiles; rulesfires --) {
        intecede -- prespondeweller(IntelRules);
        rulesfortes -- prespondeweller(IntelRules);
        rulesforting -- prespondeweller(IntelRules);
        if (intelSering -- equivaluatering);
        if (intelSering -- equivaluatering);
        if (intelSering -- equivaluatering);

// The return value is the master of elements involved in metching th/ compared to the total nature of alements.

r. (filosulmetobours / (flost) (stringlen + stringlen + 2)) * 100.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for (int ruleindex * 0; ruleindex * namehles; ruleindex+) 
// if the rule code is the same 
if (ruleode ** m_respendable(ruleindex)) 
// but the strings are different 
if (ruleofering; ** m_beleinteindex) cuput 
if (ruleofering; ** m_beleinteindex) cuput 
if (ruleofering; ** m_beleinteindex) cuput 
if (ruleofering as an alias 
aliases.insert(m_bules(ruleindex) cutput);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                :dumpEncodedRules(ofstream Loutfile, int reportMode)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  outfile << (LPCISTR) outBuf << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sprintf (out.But, "13.3d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            set «Cstring»
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ruleCode;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -> de, (LPCTSTR) nuleString,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -> TR) equivRuleString);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          int
unsigned char
String
String
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ., dex . 1. ruleCode,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .. TR) ruleString);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -> TSTR) ruleString) ;
                                                                                                                                                                                                                                                           return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         • dex • 1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     el se
                                                                                                                                                                                                                                                                                                      __`
                                                                                                                                                                                                                                                                                                                                                                                                                                                         , <u>8</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tor (int stringlindes * 0; stringlindes < stringliem * 1; **stringlindes) {
   // see it this dispup course in detabase name
templigraphStr(0) * stringlistringlindes);
templographStr(1) * stringlistringlindes * 1);
templographStr(1) * stringlistringlindes * 1);
on {
   on {
        conting;
        conting
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             now do a check for the "hidden" digraph at the end of the segment to account for the non-existant trailing space
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (alread/Matched(stringDMatchOffset) == 'N') {
   alread/Matched(string2MotchOffset) = 'Y';
   natchPoints += 2.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        an array of 'Y' or 'N' values, one for each possible digraph postition in the eval segment. Each starts out at 'H' and gets it of 'Y' when land if) it gets used. Hose that we must add I because we nomally pad the name with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ## start out by checking the first character, which is a special a case it forms an implied digraph of ** " impact. followed by the character. This, if both the query and eash how the same it first character. This if both the query and eash how the same if itself absorcer. We also the points.

| Also, since we really sear our loop with the second digraph, as set the biast factors to 0.9 rather than 1.0 |
| Its tripp[10] ** setzing[0] |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          string2Ptr * strst(string2Ptr, tempDigraphStr);
if (string2Ptr !* NULL) {
  int string2Ptr - string2Ptr - string2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PARSE.CPP 3-24-98 11:24a
                                                 // handle special case where one, or the other, or both
// strings are myory. In these case, the spore is 0, unless
// they are both enpy, in which case we get a score of 100.
if ('specing) -- EXG) | ('specing) -- EXG) |
if ('specing) -- EXG) | ('specing) -- EXG) |
ic - 100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             char alread/Matched(10 + 1); // max digraphs = length + 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // Now count the number of elements involved in matching, double matchiboints;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // Forget all previous matches.
manget(alread/Matched, 'N', mizeof alread/Matched);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           temp digraph string once
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                while (string2Ptr !* NULL);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    *string2Ptr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    matchPoints = 0.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // terminate the ten
tempDigraphStr(2) = BOS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       matchipoints;
                                                                                                                                                                                                                                                                                                                                                                                                                    rc = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              const. char
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         = =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -
else
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nuleIn ruleCo (LPCTS

1-10.10s 1-10.10s",

£3.3d

manRules . m Rules.size();

ruleString; equivRuleString;

rc = TRUE; outBut (1000);

1f (string)[stringlen - i] \*\* string2[string2Len - i]) {
 matchPoints \*\* 2.0;

strlen(string2);

string2Len rc;

int unsigned char

ruleCode, (LPC

Page 14 of 17

allases

```
sprintflerrysg, "invalid format on line Nd of simplified rules file\n"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sprintf(errMsg, "Invalid format on line td of simplified nules file\n", lineMo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        make sure that what is in the m_Bales wettor is in the replicitings wettor. Seen have furings in the replicitings wettor that are not m_Bales wettor; since the replicitings wettor that are not m_Bales wettor; since the replicitings wettor that the set is only for one culture. Suild a wettor that set is easyly for one culture. Build a vector that the parallel to the m_Bales wettor that contains the simplified regar for each rule. This will be similar to the simplified regar for each rule. This will be signified to be in the mane order fand the same size as) the m_Bales wettor.
                                                                                                                                                                                                                                                                                                                                                   /// create a vector of Catrings for the replacement strings as read from
/// the simplifiedDatesFile.
/// Also, create a paralel vector of Catrings for the simplified
/// replacement strings as read from the simplifiedDatesFile.
while (!gets!rulebaff, 1000, sumplifiedDatesFile) is rc)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // deck for eapy lines
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (logFile == NUL)
AixMessageBox(errMsg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fprintf(logFile, errMsg);
rc * FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AfxMessageBox (errMsg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             namSimplifiedBules = repStrings.size();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (logFile .. NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              lineNo++;
buffPtr * strtok(ruleBuff, * \t*);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 rc . FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 e) se
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BOOL foundRepString;
                                                                                             m_section.clear();
m_simpOcteVec.clear();
m_simplifiedRepStrings.clear();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -
else
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              . \ lineNo!;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Note that we report to a AthersageBox.

Also, the encodeGalesFile parameter can be MULL if the final list of codeCapterSide parameter can be MULL if the final list of codeCapterSide pairs is not needed.
escCSting.ilerator aliaesSetter;
tor (aliaseSetter = aliaes = end); aliaesSetter = )
tor (aliaseSetter = aliaes = end); aliaesSetter = )
aprint(outai, "1.0.100 ", (ICTSTN)*aliaesSetter);
out(le << (UCTSTN) outails</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    )
outfile <- ord!
outfile <- where of Rules: * <- maRules <- ord!
outfile <- "Narter of Rules: * <- maRules <- ord!
outfile <- "Narter of Codes: * <- c, margination to the series."

outfile <- "Narter of Codes: * <- c, margination codes <- ord!

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // from simplifiedRulesFile
from simplifiedRulesFile
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          outile << "cobell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickell\thickel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      function to read the applied (lie of simplified notes and

1.) Busine that the replacement estimps in the simplifies

2.) Create a vector of vector of codes (unsigned char).

2.) Create a vector of vector of codes (unsigned char).

2.) The simple vector contains the codes corresponding to a particular rule. The cuter vector contains the linear vector contains the new tore contains the inner vectors, and corresponds (should be in the same order as vector, when you of rules to the majouter vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PARSE.CPP 3-24-98 11:24a
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RuleSet::dumpRECCCmpArray(ofstream Loutfile)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 outfile << (LPCTSTR)outBuf << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               int namSimplifiedRules;
vector<CString>repStrings;
vector<CString>simplifiedRepStrings; //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  numRules * m_Rules.size();
numSimplifiedRules;
                                                                                                                                                                                                                                                                                                                 )
outfile << endl:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rc = TRUE;
outBuf (1000);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BOOL rc = TRUE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CString region;
CString region;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     . • 1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BCOT +
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ruleBuff[1000 + 1]; \*buffPtr; lineMo = 0; 1, 1; err\*sg(1000 + 1);

now iterate through the aliases set and print out and aliases

Page 15 of 17

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epper - regering;
while -{regper:-...\0.) {
if (regper:-...\0.) {
Sprint(lerrHeg, "Line 1d, Simplified Replacement String 1s is missin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (respire... '\0') {
    sprint(erries, '\0') {
    sprint(erries, '\0') {
    sprint(erries, 'Line Md. Simplified Replacement String %) }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // see if the expression we just parsed is in the map code/splitterstor = m_sec/up_find(exptartPtr);
if (code/up)[exact = m_sec/up, ext]) {
// we should slop Will, which is silent, since
// we want to just ignore that. However, we just
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         it. We still add an empty vector to the m_sim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sprintf(errMsg, "Attempt to ad
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (optionalOcdetrx > 255) (
that errMsg[1000 + 1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              optionalFlag = (*(expEtr - 1) == ??');
*expEtr = '\0';
*expEtr = '\0';
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // it stays paralell to the m_unles vector
if ((*expstartPtr) != '\0') {
    if (optionalFlag) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            explanter:
explanter = explan;
while ((explanter)) & (explanter)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else
fprint(logfile, enwsg);
rc • FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      closurg )\n'.

$ * 1, (LPCINTR)m_simplifiedRepStrings[j]);

if (logFile == MLL)

ALWFESSGEBOX(errNeg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     fprintf(logFile, errMsg);
rc = FALSE;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ) + 1. (LKTSTR)m_simplifiedSepStrings[j]);
if (LogFige ** NHL)
ArbussepSc(errhog);
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  expStartRri);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   d optional SEC code past 255 for expression %s*,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       el se
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               *> pCodeVec vector to make sure
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        skip generating codes for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .. s missing closing )\n",
                                                                                                                                                                                                                                                                                                                                                                                                                                                  .> g leading (\n",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ** ve forward
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      was not found in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   just a dammy value so that m_simplifiedRepStrings remains para
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      don't start at 0, since the code strin
                                                         | Side proxy replacements strings, since we want to just
| just since silents. However, we mill need to add the entry string
| to the m simplifications/partial process on that it remains the
| same size as the m_nates vector. We just skip the integrity check.
| (rull-depicting) celebraph(| | * 0) | (multiply string) | |
| (rull-depicting) = PALS;
| for () * 0: ) * and implifications : replacing | | |
| (cutting for integrating) = replacing | | |
| (cutting for integrating) = replacing | | |
| (multiply for integrating) = replacing | | |
| m_implificating = PALS;
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| m_implificating = P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (foundRepString == FALSE) {
    sprint(lerrMcg, "Rule td, Replacement String %)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               If all is ok so far, go through each of the m_simplifications/strings, and parse apart the simplified regular expression for the replacement portion of the rule. For each single-character expression in the simplified Rep String, add it to a mop fundess it is already there), using an unsigned that code (For volues that are to already there), optional, we use codes shown 139. Either vey, add that code to a temporary vector (which holds the codes for this simplified regular expression, add the composary vector to the m_simplocables, which corresponds on the m_simplocables, which corresponds to the m_bales vector, and holds a simplified code vector for each rule.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        fprint(logFile, errMsg);
rc * FALSE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (logFile == MJL)
ALoMessageBox(errMsg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     m_simplifiedRepStrings.push_back("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          nup.CString, unsigned clar>::iterator coleMapIterator;
clar repString[100 + 1];
tot (i = 0; i < mandules; i++) (
ruleSepString = m_Sules[i].output;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 unsigned char aptionalCodeInx • 129;
unsigned char mandatoryCodeInx = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           torkunsigned characempCodeVec;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                *expPtr;
*expStartPtr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  optionalFlag;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 i, (LACTSTR) coleRepString);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .. simplified rules file\n".
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .> Ilel to the m_rules vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .. g is mull cerminated
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Page 16 of 17

m\_sectop(expStartPtr] = optionalCodeIn

TW is reasty

if (\*(repString+4) \*\*\* (')
if (\*(repString+5) \*\* 'a'

PARSE.CPP 3-24-98 11:24a

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CS improde Distrable •
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sprintf(errieg, 'Attempt to ad
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 it (encode/BallesFile := NULL) { \( \frac{1}{2} \) \( \text{code/Apliterator} \) : \( \mathbb{n} \) = \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( 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\( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \mathbb{n} \) \( \ma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        m_secMap(expStartFtr) = mandatoryCodeI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tempCodeVec.push_back (mandatoryCodeInx
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sprintf(tempMeg, "Adding to with td codes", (LPCTSTR)m_simplifiedRepSt
tempodevec.push_back(optionalOodeInx)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the string was found in the map of simplified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // so just add it's code to the temporary vector int tempCode = codeMpIterator->second; tempCodeVec.push_back(codeMpIterator->second);
                                                                                                                                                                                                                                                                                                               {
1f (mandatoryCodeinx > 128) {
char erring(1000 + 1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ALaMessageBox (errMSg);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mandatoryCodeInx..;
                                                                                                                                                            optional Orde Inter-;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A vector parallell to the rules that holds the simplified regular expressions for each rule (CString values)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A vector parallel to the rules that holds the vector of codes for each rule (vector of unsigned char)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         fprintf(encodedRulesFile, *120.20s ... 1d\n",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         )
| if all went ok, add the codes for this nule to our
|// vector of code vectors.
if [kc] {
| char temphag[1000 + 1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if requested, we should write out the map of simplified regular expressions (along with their corresponding codes.
                                                                                                                                                                                                                                 - 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             m_simpCodeVec.push_back(tempCodeVec);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    expStartPtr);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // AfdessageBox(tempMug);
int tempSize • tempCodeVec.size();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             *> d mandatory SEC code past 128 for expression %s",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if all is still ok, we have:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     //
www.rings(j], tempCodeVec.size());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -> defapiterator++) {
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    • BK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   :
```

\*newCSimpCodeDistTable - new CSimpCodeDistTable(aPeatTable, &n\_sectEp); RuleSet::createSimpOodeDistTable(CPeatureDistanceTable \*aPeatTable)

return nexCSimpCodeDistTable; CSimpCodeDistTable

return rc;

PARSE.CPP 3-24-98 11:24a

```
for (i_score * m_scoredMames.begin(); i_score (* m_scoredMames.end(); i_score**)
delete *1_score;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Scoreatures::iterator i_score;
lor (i_score = m_scorediames.eriu(); i_score := m_scorediames.eri(); i_score++)
delete 'i_score;
m_scorediames.clear();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        m_mandames . 0; // will be reset by the init() function
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          void Runker::iiiit (ronst Riem kquery), coact Riem kquery),
coost Riemerers kpirme,
coact iint max jame,
coact (Yeatum®)istancefuble *td)
Copyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    statte const int count_syllables(const char *str_in);
                                                                                ranker.cpp: implementation of the ranker class.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Scoretames::iterator i_score;
                                                                                                                           See ranker.h for documentation.
                                                                                                                                                                                                                                                                                                       n_voel_intax['1''] + 0;
n_voel_indax['E'] = 1;
m_voel_indax['E'] = 2;
m_voel_indax['v'] = 3;
m_voel_indax['v'] = 4;
n_voel_indax['v'] = 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     m_query(0) * query1;
m_query(0) .makeUpper();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                query(1) - query2;
query(1) makeUpper();
                                                                                                                                                                              ..........
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         n_stringfames.clear();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           parameters - params;
                                                                                                                                                                                                                      #include "sidafx.h"
#include "ranker.h"
#include 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ranker:: 'Ranker()
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ranker::Ranker()
```

RANKER, CPP 3-24-98 11:24a

i\_str = m\_stringNames.find(str); m\_stringNames.erase(i\_str);

Page 1 of 5

```
March of the control of the point to see if they float or sink.

Design on the control of the pulsace to the point of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the cont
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// narrative paragraph number 4.4.6
static const float culture_score(e_tds_culture culture), e_tds_culture culture2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for (byte *p cross_cast-byte *)(cross_un); *p := '\0'; p+\)
for [byte q = cross_cast-byte *p;cross_ln); *q: '\0'; q+\)
if (i'td) gr_centre_distance(*p, 'q) < mn_diff)
min_diff = ('td) gr_cfeature_distance(*p, 'q);
if (0.0f < min_diff & emin_diff < 1.0f)
re * 1.0f : min_diff;
                                                                                                                                                                 /* phonetic_score
Returns a value in [0.0, 1.0] representing the value which was calculated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "/ narrative paragraph narbor 4.4.4

fattic crust float lead_come_score(comet byce *const_in, const byce *const_in, Grattic crust float lead_come_score(const_in, const byce *const_in, const_in,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Recurs a value in [0.0, 1.0] representing a closeness in the spellings
of the two names, and is calculated based on the number of bytraes and
single character which match between the two given strings.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    float rc = 0.0f; // very far away float min_diff = 1.0f; // very far away since this is the compliment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /* lead_com_score Returns 4 value in [0.0, 1.0] representing a scale of the minima to maxima propertic-features distance which separate any of the leading concounts of the two names. 0.0 is very far away, 1.0 is real close concounts of the two names.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /* cuiture_score Returns a value in [0.0, 1.0] representing a peralty for when the culture of the query and database names den't match.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       static const float phonetic_score(const float score)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  rc - culturel -- culture2 ? 1.0f : 0.0f;
                                                                                                                                                                                                                                                                                                                                   by the calling program.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    return score;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return rc;
} // lead_cons_score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  recurn rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // culture_score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                float rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a promotic score - phonetic general phonetic Score);

a_culture_gene - culture_gener (equery_mited_general);

a_culture_gene - culture_gener (equery_mited_general);

(void) spall_gener (equery_mited_general);

(void) spall_gener (equery_mited_general);

a_general_general), a_ited_vecki, query_mited_general;

a_gelliate], a_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_general_g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Anterior paragraph names (4.4.7)

// There appears to be a bag in the optimizer-the "volatiles" (ix it for now volatile float namerator = perme getChitured, or m_anterior score parama getChitured, or m_anterior score parama getContract() = m_lead cons score parama getContract() = m_lead cons score parama getColline() = m_goolling_score parama getColline() = m_goolling_score parama getColline() = m_goolling_score parama getColline() = m_goolling_score parama getColline() = m_goolling_score parama getColline() = m_goolling_score parama getColline() = m_goolling_score
// Woter helpst functions. Those must return values in the range [0.0, 1.0].
static count flot protectic_good-count for a count flot static count flot culture, good (count flot culture, good (count flot lead_coun_good (count flot lead_count flot lead_count flot flot good (count char', count char, count that count flot givel] good (count char', count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, count char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, char, ch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Calculate a weighted average of all voters.

    params.getSpell2Wt()
    params.getSyllableMt()
    params.getVowelMt();

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   params.getPhoneticMt()
params.getQiltureMt()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         const unsigned int wowel_index[256]);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           params.gettäakkonswt
params.getSpelllwt()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 void Ridme::score(const Ridme Aquery, const Razamuters Aqurams, const int query_syllables,

CFostureDistanceTable 'fd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                *Strl_in,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    static constitut syll_score(const char *, const int); static constitut vowel_score(const char * *strl_; *strl_;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      const unsigned int vowel index[256])
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          volatile float denominator -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           above helper routines.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      try (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       •
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     >
```

if (m\_weighted\_score < 0.0f)
m\_weighted\_score = 0.0f;

m\_weighted\_score = 0.0f;

return; // not attempting to do anything else right now

) catch (...) { ASSERT(0);

Page 2 of 5

RANKER.CPP 3-24-98 11:24a

n\_weighted\_score = numerator / denominator;

```
? (bi_match_count + m) / (weights[strl_len - 1] + weights[strl_len - 1] + n) : (bi_match_count + m) / (strl_len - 1 + strl_len - 1 + n);
if [bass] { // decrement entch-bias if [bass] e. ND_DNAL; mo_compensate = false; } if [bass_q = ND_DNAL; mo_compensate = false; }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // Cornider oneal vs. neal; change to oneal vs. areal, where x matches anything,
// but it only get 0 0.5 point instead 0.1. Then cann = 2.10.5 plus
// it's like adding one more possible digraph (not not). This is only for
// it's like adding one more possible digraph (not not). This is only for
// biggers
int m = 0, n = 0;
if lead oneal; i.e ADDE is lead onel; 2 = RADDE
// little adding one more possible digraph (not not).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | will | q := MULJ;
|/ for monograms
|/ for monograms
| f (qq := MUL) | spore the leading and trailing blanks
| for (q = RT2 + 1; * (q + 1) ! * * \(Q'; q + *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f (q - *) | f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // The return value is the number of elements involved in matching // compared to the total number of elements.

bi_score • bias
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return (2.0 * bi_score + mono_score) / 3.0; // a 2:1 ratio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         n . 1; // one more digraph
                                                                                                                                                                    // for bigrams
                                                                                                                                                                                                              q - str2;
do (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mono score - bias
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           } /* spell_score */
#pragma optimize("g", on)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               weightei() - weightei() - 1.00;

for (int 1 - 2); is faired weightei() ist i - would; i--)

for (int 1 - 2); is faired weightei() if 1 - 1.00x · (1 - 1);

for (; 1 - anisof weightei / aixed weightei(); i--)

for (; 1 - anisof weightei / aixed weightei(); i--)

first_inte / sales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    bool bi_already_metchal[RANDER_NAWE_5126 • 1]; // max bigrams = name size + 1 bool mo_already_matched[RANDER_labwe_5126]; // max monograms = name size
                                                                                                    "// narrative paragraph number 4.4.1

// narrative pregraph number 4.4.2

// narrative pregraph number 4.4.2

// ficegon optunize("g", off) // there appears to be a bug in this optunize(on crust float spell_george(count dar *etrl_in, count char *etrl_in, count char *etrl_in, count char *etrl_in, count char lead_vowel_2, count char lead_vowel_2, float enron_score, float bi_score)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RANKER.CPP 3-24-98 11:24a
          less than those on the left.
The score will possibly be modified if this name has a leading vowel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // Forget all matches.
memost(bi_already_matched) false, pizeof bi_already_matched);
memost(im_already_matched) false, pizeof mo_already_matched);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  dur scripanosa jawe 5122 - 2 - 1);
etri [0] - scripinosa jawe 5122 - 2 - 1];
stri [0] - scrip[- sluwx,
strop[- sluwx]
strop[- sluwx]
strow[- sluwx]
strow[- sluwx]
strow[- sluwx]
strow[- sluwx]
strow[- sluwx]
unisped in stri_len - strien[stri];
dur cemp stril] - '\0';
                                                                                                                                                                                                                                                                                                                                                                                                                                                        #:frdef BLAG:
static const char BLANK = '';
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (first_time)
```

mo\_match\_count +\* bias\_q + (mo\_compensate ? DECR : 0.0f) + bia

unsigned int & - static\_castconsigned int (q · (str2 · 11));
if (inp\_lated)\_matched(da) |
in\_pleady\_matched(da) | true;
if (blas) { // decrement match-blas}
if blas { // decrement match-blas}
blas & 1.0 · DDN · dc;
if (blas\_& + NH\_DVML) blas\_& + NH\_DVML;

unsigned int dx = static\_cast.unsigned int>(q - str2);
if (ib) \_already\_antched(cd) = true;
if (blas) { // decrement match bias}
if (blas) { // decrement match bias}
blas\_dx = 1.0 - DRON = dx;
if (blas\_dx dx = true | DRON = dx;
if (blas\_dx dx = true | DRON = dx;
if (blas\_dx dx = true | DRON | blas\_dx = true | DRON,

q = strstr(q, temp\_str); if (q != NALL) {

match\_count + blas\_q + blas\_db;

else

### Page 3 of 5

? mo\_natch\_count / (weights!stri\_len · 2] + weights(str2\_len · 2]) : mo\_natch\_count / (stri\_len · 2 + str2\_len · 2);

```
// A / ( 1.04 ) ( 0.55 ) , ( 0.68 ) , ( 0.14 ) , ( 0.58 ) } // A / ( 1.04 ) , ( 0.55 ) , ( 0.68 ) , ( 0.14 ) , ( 0.18 ) } // A / ( 1.05 ) , ( 0.16 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0.18 ) , ( 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Returns a value in [0.0, 1.0] representing how close the first vowel or dipthong of each name is to the other.

Both names need at least one vowel, else 1.0 is returned.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Values used by vowel_score() below.
static const float vowel_distances[NIM_WOWELS] *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            #define NUM_VONELS 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           / vowel_score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cract int at * count_syllables(strl_in);
cost int diff * at < s2 ? s2 * s1 : s1 * s2; //Any doesn't this work? std::Ans(s1 * s2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RANKER.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  F is one vewal.
Final ES 4 do not count, so Marres is one, not two syllables.
But the exceptions to the ES rule are CES, GES, NES, SES, NES and EES.
Its vawels implies one syllable.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Final E's do not count, so Alice is two, not three syllables; but a single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // and a tinal ES
!(*p == 'E' && *(p + 1) -- 'S' && *(p + 2) -- '\0')
Pacture a value in [0.0, 1.0] representing how close the syllabilitization errorizour is between technical and in the count difference, where each the scott is derived from the syllable-count difference, where each syllable difference counts as 0.2, down to a minimum of 0.2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              / count_syllables / Counts the number of yowels or yowel Counts the number of yowels or yowel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sequences.

The second is a simple vowel/dipthong count on the spalling of the name; this is sufficient, since we don't need to know where the syllables are, only a count of them.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // always count a wowel at the beginning of the name
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // If we end in ES and that is preceeded by C, G, N, S, X or 2, // we actually want that last count: If (p - str.(x) - x) = 44 + (p - 2) = -(2 + 4) + (p - 2) = -(2 + 4) + (p - 2) = -(3 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p - 2) = -(4 + 4) + (p -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      toc (char *p * const_cast*char *>(str_in); *p !* '\0'; p**)
// have to have a vowel
                                                                                                                                                                                                                                                                                                                                                              "/

reacte coret float syll_corefconst that "strl_in, coret int $3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  const float rc = diff <= 4 ? 1.0f - diff * 0.2f : 0.2f;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // and a final E
!(*p == 'E' && "(p + 1) == '\0')
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        static const int count_syllables(const char *str_in)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (is_vowel(*p)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return max(rc, 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             int rc = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       / is vowel
```

: ( , , , - 句 | , p, - 句 | , o, - 句 | , t, - 句 | , s, - 句 | , y, - 句 |

A, g, I, O, U, Y. We also treat the Y as a vowel so that the count\_syllables routine gets two for such names as Randy and Cheryl

\*/ static inline bool is\_vowel{const\_char\_ch}

static bool inline is wowel (const char ch);

/• s/11\_5core

return isalpha(ch)

// If we get here, there is at least one wowel in each name.
// Naw Lock to see if there are dipthongs.
// Naw Lock to see if there are dipthongs.
const chart Q2 \* is yowel(\*q\* 1)) ? \*(q\* 1) : \*\0.0';
const chart Q2 \* is yowel(\*q\* 1)? \*(q\* 1) : \*\0.0';
rt \* wowel\_distances(wowel\_indes(\*pl))(wowel\_index(\*ql)); Page 4 of 5 // narrative paingraph narrer 4.4.5
static const float vowel\_score(coste dar 'strl\_in,
const char 'strl\_in,
const unsigned int vowel\_index[156]) for (p \* const\_cast<char \*>(strl\_in); \*p !\* '\0'; p\*\*)
if (is\_vowel(\*p)) m\_name\_str = ""; m\_classOulture = TDS\_OULT\_ANGLO; m\_pipeOulture = TDS\_CULT\_ANGLO; } (.0\. \*; b.) jī char \*p; float rc • 1.0f; return rc; RName:::RName()

```
Rhame::Ritera (corat: string 40, corat e_tds_culture classCul., corat: e_tds corat: e_tds corat float
                                                                                                                                                                                                                                                                                                                                                              const byte c(\{ \}, const char v, const bool e)
                                                                                                                                                                                                                                                         m_weighted_score = 0.0f;
m_lead_cons(0) = '\0';
m_lead_vowel = R_MCNE;
m_is_exact = false;
```

m\_now\_str = n;

a\_icasoliture - classOli;

a\_pipcoliture - pipcoli;

m\_pronetic\_score - ps;

m\_scorry\_lass\_core;

n\_lead\_voret - v;

n\_is\_coret - v;

Riume(); // sets scores to zeros

void Riame::assign(const Riame &c)

m\_nam\_ucc \* c.m\_nam\_act;
m\_classoluture \* c.m\_namulucc;
m\_plassoluture \* c.m\_namuluccalluture;
m\_plassoluture \* c.m\_namuluccalluture;
satesexpv m\_lead.com \* c.m\_lead.com \* R.W. LEND\_CONS);
m\_lead.com \* c.m\_lead.com \* c.m\_lead.com \* m\_lead.com \* m phonetic\_score . c.m\_phonetic\_score;
ancliuse\_score . c.m\_phonetic\_score;
a lead\_cons score . c.m\_lead\_cons score;
a gpallingl\_score . c.m\_ppallingl\_score;
a gpallingl\_score . c.m\_ppallingl\_score;
a pyllable\_score . c.m\_syllable\_score;
a\_vael\_score . c.m\_syllable\_score; a weighted score . c.m weighted score;

if (a is exact to it a is exact)

if (im\_is\_exact to fis\_exact)

if (im\_is\_exact to fis\_exact)

return tous;

return a\_weighted\_score < c.m\_weighted\_score; // narrative paragraph number 4.4.8 bool Riame::operator<(const RName &c) const

return m\_weighted\_score == c.m\_weighted\_score; bool Riame::operator\*\*(coust Riame &c) const

RANKER.CPP 3-24-98 11:24a

if (ml->getIsExact() & !ml->getIsExact())
return (alse;

if (!ml->getIsEact() & m2\_>getIsEact())

bool less Rieme: : operator() (const Riema \*tnl, const Riema \*tnl) const

```
void CSumpColdDistTable::calc_values(GreatureDistanceTable_ftable,simp_codes_map *symtols)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for (main_symtolit • symbols->begin(); main_symbolit !• symbols->erd(); main_symbolit++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CSimpCodeDistTable::CSimpCodeDistTable (CReatureDistanceTable *fdtable, simp_codes_map *symbols)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // initialize everything else to -1,000,000. The cells // corresponding to used codes will be reset to a value // order than -1,000,000 (some positive integer between 0 and -// 10,000. The -1,000,000 will be used as, a validity check if
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Cotring key_string, scan_string;
int set_i, set_i) // these index into the symbol code tuble
int set_i, set_i) // these index into the symbol code tuble
sing_codes_inqu::iterator main_symbol it;
sing_codes_inqu::iterator scanner_symbol it;
int_lowest_value;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // initialize the optional deletion part of the row to 0 for() - 129; j < 256; j**) m_simp_code_dist_table[0]() • 0;
Copyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // unitablize the insertion col (col 0) to 10,000
for(i = 0; i < 256; i++)
m_simp_code_dist_table(i)[0] = 10000;</pre>
                                                                                                                                                             // The Simple Code Feature Distance Table class // CSimpCodeDistTable is dependent on the // CreatureDistanceTable class
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for(1 = 1; i < 256; i++)
for(j = 1; j < 256; j++)
m_simp_code_dist_table(i)[j] = -1000000;</pre>
                                                                                                                                                                                                                                                                                                  // the simple codes are split into two groups // non-optional codes have values [1,128] // optional codes have values [129,255]
                                                                                           // CSumpCodeDiatTable implementation file
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for(j = 0; j < 256; j++)
m_simp_code_dist_table[0][j] = 10000;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CSimpCodeDistTable:: "CSimpCodeDistTable()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                void CSimpCodeDistTable::init_table()
{
                                                                                                                                                                                                                                                                                                                                                                                                                              #include "stdafx.h"
#include "simpoodedisttable.h"
// #include "defines.h"
// #include "resource.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    init_table();
calc_values(fdtable,symbols);
//damp();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   inc i, j;
```

int CSimpCodeDistTable::calc\_insertion(const char \*string, CreatureDistanceTable \*ftable)

int lowest = 1000000; int il,i2,length,fdist; unsigned char buff[10];

lowest \_value = calc\_lowest\_score((IACTSTR)key\_string,(IACTSTR)scan\_string,ftable); m\_simp\_code\_dist\_table[sct\_i| {sct\_j| = lowest\_value;

else // (x) -> (y)

// this will only occur once and will not effect the // simp code table so this is an empty condition.

nse if(ecm\_arring.isDmpcy()) // (s) -> 0 this is a deletion lower, value = calc deletion((LPCTSR)kp, string, ftable); e\_simp\_code\_dist\_table(0|[sct\_i] = lowert\_value;

ley\_string \* main symbolit >>first;
str. 1 \* main symbolit >>sectoris >>

# Page 1 of 2

SIMPCQ-12CPP 3-24-98 11:24a

int GimpCodeDistTable::calc\_deletion(coust char \*string, @batureDiscanceTable \*ftable) {

fdist = 10000 \* (ftable-spr\_feature\_distance(buff(ii), (unsigned char!MIL));
if(fdist < lowest)
lowest = fdist;</pre>

return lowest,

for(il = 0; il < length; il++)

length • 12;

// strip out | and ?
for(il = 0; il < length; il++)
if(string[il] != '|' 64 string[il] != '?')

buff[12] = string[11];

for(i1 = 0; i1 < 10; i1++)
buff(i1) = NOLL;

length - strlen(string);

11 - 12 - 0;

```
sprint(img, 'Could not open simpdump.txt for writing');
Afterssapebox(img);
return;
                                                                                                                                                                                                                                                                                   if ((schimp = fopen("simphinp.txt","v")) == NULL)
void CSimpOodeDistTable::damp()
                                                                                                                                                                                                                                                                   for(j = 0; j < 256; j++)
                                                                                                                                                                                                                                tor(i = 0; i < 256; i++)
                                                                                                                                                                                                                                                                                                                                      fprintf(schmp, "\n");
                                                                                                                                                                                                                                                                                                                                                                              (close (scdump);
                            int i, j;
FILE *sockup;
char meg(2551;
                                                                                                                       fdist = 10000 * [ftable-squt_feature_distance(unsigned char)MGL, buff(iil));
if(dist < lowst)
lowst * fdist;</pre>
                                                                                                                                                                                                                                                                                              int (Simplodeb)stfable:calc_lowest_score(const char 'skey_string,
const char 'stan_string,
Creatureb)stancofable 'ftable'
```

unsigned clar key\_buff(10); unsigned clar scan\_buff(10); int 11,11,12,12; int key\_length \* strlen(key\_string); int scan\_length \* strlen(scan\_string);

i1 - j1 - i2 - j2 - 0;

key\_buff(i) \* MJL; scan\_buff(i) \* MJL; } for(i • 0, i < 10; i++)

int i; // generic counter int lowest \* 10000000; int fdist;

fdist = 10000 • (fdable->get\_feature\_distance(bey\_buff[ii], scan\_buff[ii]); if(dist = lowest) lowest = fdist;

return lowest;

// strip out | and ? for(ii = 0; ii < length; ii++) if(strong|li] !+ '|' ii string(ii] !+ '?')

for(11 = 0, 11 < 10; i1++)
buff[i1] = Will:

lenyth • strien(string);

11 - 12 - 0;

int lowest = 1000000; int il.i2,length,fdist; unsigned that biff[10];

butf[i2] + string[11]; i2++;

tor(11 = 0; i1 < length; i1++)

length . 12;

recurn lowest;

for(j1 = 0; j1 < scan\_length; j1++) for(il = 0; il < key\_length; il++)

scar\_length • 12;

SIMPCO-1:CPP 3-24-98 11:24a

. ... scan\_st.
scan\_buff[j2] . scan\_string[j1];
j2++;
}

// strip our pipes (ors) and question marks from strings for(i) = 0, ii < key\_length; ii <+) (if (key\_string[iii] := '[ ' if key\_string[iii] := '?')

key\_buff[i2] \* key\_string[i1]; i2\*\*;

```
//calculate maximinam number of differences to stay below the threshold maxbiff = (1 - threshold) * maxSize;
                                                                                                                                                                                                        //pad string with BLANK at beginning and put longest
//string in strl and shortest in strl '
if (size2 > size1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     //compute array cells begining with 1,1
                                                                                                                                                                                                                                                                                                               strl(i+1) = str2(i);
i++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     strJ[i-1] - strl[i];
i--;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         strJ[i+1] = str2[i];
i++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             stri(i+1) • stri(i);
i++;
                                                                                                                                                                                                                                                      strl[0] = ' ';
i = 0;
while (strl[i] != EDS)
                                                                                                                                                                                                                                                                                                                                                                         str[[i+1] = BDS;
str3[0] = '';
i = 0;
while (str1[i] (= BDS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ser!{0} = '';
i = 0;
while (ser![i] != BOS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          f
tri(i+1) = BOS;
stri(o) = '';
i = 0;
while (str2(i) != BOS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 curbiff • 999;
j * 1;
while (strJ(j) !• BDS)
                                            //ger size of strl
sizel * strlen((char*)strl);
if (sizel * STRANGOA)
return(-1);
                                                                                                                        //get size of str2
size2 = strlen((char*)str2);
if (size2 > STRINGAX)
return(-2);
 mauSize;
distance;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   strJ(i+1) = BDS;
maxSize = size2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      strJ[i:1] = BOS;
maxSize = sizel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      i = 1;
while (str1(i) (= EDS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        const char *str2
                                                            // Namber tunctions
                               // sumpleed.cpp: implementation of the CSimpleEditDistance class.
                                                                                                                                                                                                                                                                                                                                                           //initialize first row and column to ascending integers for (i=0;\ i < (STRREDWX+1);\ i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /*
float CSimpleEditDistance::getDistanceScore(const char *strl,
Cupyright (C) 1998, Language Analysis Systems Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                oid CSimpleEditDistance::setThreshold(float inThreshold)
                                                                                                                                                                                                                                                                              for () • 0; j • (STRINEMAX+1); j••)
                                                                                                                                                                                                                                                                                                             distanceArray[i][j] • 0;
                                                                                                                                                                                                                 //initialize distance array to all 0's int i = 0, j = 0; tor (i = 0; i < (STRINGMAX+1); i++)
                                                                                                                                                                                    CSimpleEditDistance::CSimpleEditDistance()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CSimpleEditDistance:: CSimpleEditDistance()
                                                                                                                                                                                                                                                                                                                                                                                                        distanceArray(i)[0] = i_i
distanceArray(0)[i] = i_i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           !loar CSimpleEditDistance::getThreshold()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               threshold . inflireshold;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  strl(STRINDAX*1);
strJ(STRIDAX*1);
diff;
lowest;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return(threshold);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   macDiff;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       threshold = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      î._
```

SIMPED-1.EPP 3-24-98 11:24a

Page 1 of 2

```
age 2 of 2
```

distance \* distanceArray[i-1][j-1];
return(1.0 - ((distance/DIFFNAX)/maxSize));
return 1.0f - (distance / (float)maxSize);

diff = 1 + distanceArray(i-1)[j-1];
if (diff < 10est)
loest = diff;
distanceArray(i)[j] = Loest;

el 5e

//coning from the left
//coning from adrawes.rray[1][-1];
//coning from above
diff = 1 - distanceArray[1-1][5];
if (diff < lowest)
Lowest = diff;
//coning from above left
if (fife; = \* sital)
diff = distanceArray[1-1][5-1];
diff = distanceArray[1-1][5-1];

//compute rest of array starting with second row i = 1; set i = striftart; while (sert i = 205)

striStart = strl; striStart = strl; j = 1; strJ = strJStart; while (\*strJ != EDS)
{

STDAFX.CPP 3-24-98 11:24a

// Copyright (C) 1998. Language Analysis Systems Inc.
// stafet, opp : source file that includes just the standard includes
// Constitutes, poin vill be the pre-compiled bander
// stafet, do) vill contain the pre-compiled type information

#include "stdafx.h"

```
if (ch := aString) { // if there were leading

char "taryet = aString;

while (ch := aSS) {

'taryet = 'ch;
```

| | and get the mull char also | | ward get the mull char also | 'carpet = 'carb, | | end if (are the leading spaces?) | | end if (are ther leading spaces?) | | end if there a string at all ?) | | end if there a string at all ?) |

Implementation of various utility functions used in the SWAFF

5/15/97 EFB

Copyright (C) 1998, Language Analysis Systems Inc.

File: Srucil.cpp

Description:

function to do a stromp on unsigned chars tde\_unsigned\_stromp(const unsigned char \*s1, const unsigned char \*s2)

while ((\*s1 != ROS) || (\*s2 != ROS)) {
 if (\*s1 != \*s2) {
 break;

> # \_

\$1...; \$2...; else

function to remove leading and trailing spaces from a string

'tds\_util.h'

#include

«string.h»

tunction to remove leading and trailing spaces from a striit in place.

| Strip the string at either end or both ends.
| Stripchuse specify the characters that should be stripchuse specify the characters that should be striping. We start by ceeding if they want by the trailing characterises and teating. However stripped, which is easy, we simply next into place and stripply locking for the first one-strippable character. Then if they wanted string just past that character. Then if they wanted the inter one-strippable character. Then if they wanted he is placed to the strip one-strippable char, and then move that and each following | character the strip in character the strip in character the strip in character the strip in character the strip in the strip in the strip of the strip |

Page 1 of 1

// now find first non space, we know string has at least one
// nowhite space, so we don't have to check for MJL.
for (ch = aString; strabt(IMS\_DERAUL\_MITESPAZE, 'ch) (\* NULL; ch\*\*) TDS\_UTIL.CPP 3-24-98 11:24a

) if (\*s1 \*\* \*s2) return 0; else if (\*s1 < \*s2) return -1; else return 1;

// and work back till we get a non-space or get to
// the begining of our string, chopping off what's left.
// Also make sure we den't zoom right past the beginning of the
// string.
(or (; strchr(TRS\_DERMIN\_MITTESPACE, "end\_point) != NMLA fa end\_point != aString; end\_point.

if ((len = strlen(aString)) != 0) ( // if there is a string

char \*end\_point; char \*ch; int\_len;

// start at end end\_point • aString + len - 1;

;
if string was all whitespace
if (led point = abstring) is scrib (TDS DEPAUL) WHITESPACE, "abstring) != NULL)
\*Astring = BDS; // erase it all, and we're done, could return here

• (end\_point + 1) • EOS; // just, chop off excess blanks

// make sure there is still a string, since it might // have been stripped entirely above. if if (\*aString) {

```
grouption coffeets blackmen [TDS_CALT_NATLO] = TDS_NATLO_GROUP_NAME_OFFSETS_FILE;
grouption coffeets blackmen [TDS_CALT_NAME() = TDS_NAME(_GROUP_NAME_OFFSETS_FILE;
grouption coffeets blackmen [TDS_CALT_NAME() = TDS_CALT_NAME(_GROUP_NAME_OFFSETS_FILE;
grouption coffeets blackmen [TDS_CALT_NAME() = TDS_NAME(_GROUP_NAME_OFFSETS_FILE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // 3 vowel rudes rudes that MAZD) = TDS MAZD, 3V RAISS FILE; rudes) Viblekween FIDS CALT_MASHC! = TDS_AMSHC_3V RAISS FILE; rudes) Viblekween FIDS_CALT_MASHC! = TDS_CARRESS_3V RAISS FILE; rudes) Viblekween FIDS_CALT_MISSANCC] = TDS_GARRENTC_3V_RAIDS_FILE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            group? itelanes [TD_GLLT_ANGLO] • TDS_ANGLO_GGUP_PILE;
group! itelanes iTDS_GLLT_ANAGLO • TDS_ANGLO_GGUP_PILE;
group? itelanes ITDS_GLLT_GURESE] • TDS_GURESE_GGUP_PILE;
group? itelanes ITDS_GLLT_HISPANIC] • TDS_HISPANIC_GGUP_PILE;
nome; i element TEG CHIT, ANCLO) - TEG ANCLO, 1999; FILE;
nome; i element TEG_CHIT, ANCLO] - TEG_ANCLO; ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANGLO, ANG
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if (ruleSers[i])
    delete ruleSers[i];
    ruleSers[i];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (ruleSets3V(i)) {
   delete ruleSets3V(i);
   ruleSets3V(i) = NEL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (namePiles(i) != NUL)
fclose(nameFiles(i));
nameFiles(i) = NUL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (groupDataii))
delete groupData[i];
groupData[i] = NUL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TDSSearcher:: TDSSearcher()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IDSSEA 1.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                 typubit Ranker::Scorudianes::reverse_iterator tds_results_iterator_t;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  canderParms • cdefaultRanderParms;
nackmenToReturnPerty • Th DEFAULT, MAX, NAMES, PRR, QUBMY;
nackmeatLoistenThresh • ThE DEFAULT, NAME EDITIOIST THRESH;
symptolioibistThresh • ThE DEFAULT, GGOD_EDITIOIST THRESH;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         initialize the ranker weights to the defaults
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  fatRankerThreshold * rankerParme.>getThreshold();
fatRankerModdmes * TDS_DEFAULT_MAX_NAMES_PER_QUERY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  status - false;

aimpliciasMaserite - NULL;

for (int i - 0, i < TDS_LUM_CULTURES; i++)

ruleSets(i) - HULL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             watch name is disabled by default
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                specifiedOulture = TDS_CULT_MGLO;
preRankerBRhode = TDS_BF_MODE_LONE;
postRankerBRhode = TDS_BF_MODE_TRREE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   defaults for the fat ranker
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 querySingVowelVariants[0] = NUL.;
querySingVowelVariants[1] = NUL.;
query3VowelVariants[0] = NUL.;
query3VowelVariants[1] = NUL.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cultureMode . TDS_CULT_MODE_AUTO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ruleSetsJV[i] = NULL;
nameFiles[i] = NULL;
groupData[i] = NULL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                featureDistanceTable * NOLL;
simpCodeDistTable * NOLL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       . editDistancizer = NUL;
simpleEditDistancizer = NUL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         teatureEditDistancizer = NUL
Namclassifier = NUL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            global error stream variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TDSStarcher::TDSSearcher(ofstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                falsevar = false;
stepvar = ifalsevar;
logstream = alogstream;
logbetuginfo = false;
querystats.clear();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // global error strom
ofstream err;
CDistance soundDistance;
                 #include "cgrep.h"
Winclude "tds_util.h"
                                                                                                                                                      #include
```

initialize the arrays that hold the file names for the different data objects.

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class file for the TUSSearcher class.

simpleBiltDistancizer-seeThreshold (groupEdicDistThresh); break;	case : rr - inideroquersy (TEG GOOD JARAY [?!E.). n_group_array]; break;	case 2: rc = loadblies(); break;	case ): rr = loadiVales(); break;	case 4; rr = loadkandkta(); break;	case 5: rc = loadiroqs(1; break;	case 6:  // the simpCodeDistTable describes the relative similarity between // each of the SGD. The Tubest builds the 16st of SGD. and provides // a method to create a new CsimChaeDistTable object. However this	// can only be done after the rules have been read in and associated // with the simplified rules (its. Thus is any this code appears // after the rules have been read in. // lab. since the simplified nutles may maintained within the // since the simplified nutles and maintained within the // rules object is the same for all the rules (since they all use	// the same simplified rules file), we only have to create one table, // uning an arbitrary rules object. (Anglo). // create an object for the float distance matrix featureDistanceTable • new GreatureDistanceTable (TD_IPA_TABL_DISTANC_	rc • (eatureDistanceTable•-yet_status!); break;	case 7; simpCodeDistTable • toleSets[0]->createSimpCodeDistTable(featureDistanceTable)	editbisrancizer • new Œditbistance(simpCodeDistRable); featureEditDistancizer • new FeatureEditDistance(featureDistanceFable); broak;	case 8: // create the name classifier object. nameClassifier • new nasinas::NAS_ARABIC,	, APAR, ZITE, DO ZIBAKA, ZRH	INS_MARBIC_CR_DIGRAPHS_FILE_INNE.	NGS ARABIC OF TRIGRAPHS FILE NAVE.	NDS_ARABIC_SN_FILE_URWE.	IMS_ARABIC_SI_DICHAPHS_FILE_IMPRE.	NOS_ADABIC_SI_TRICTALMS TILE_NAME.	Sec_all_oll_ce.	Page 2 of 18	
delece (secured)stanceribile; if (supposedbate is MLL) delece simposedbattable;	If (edit))spantiant = MIL)  delse editoisantiant  it (implesitionantiant = ML)	delete displedibilitazionizzo; if (festuredistribilitzancizzo; delete festuredilubitzancizzo; if (immodasofizie: i- NULA)	object amendabilitat; // cepty ou all the data we collected on the query entx/damesdu(i):	// empty any linguing query variant info it (querySingVoetVariants(0); delete querySingVoetVariants(0); querySingVoetVariants(0) = Mall.;	if (querySingVenelVariants [1]   4 MIL) {	1 (query)VowelVariants(0) ; (query)VowelVariants(0); query)VowelVariants(0) = NfLi;	i: (quary)WowetVariants(1) != MUL.) {     dailer quary)WowetVariants(1);     query/WowetVariants(1) = !MUL.; }	React wamp ():	ž,	tool is a simply exostrating stokais = 9;	// cather than have some hage nested init loop and obeck the // return codes each that, I just created an artificial loop // and cuse statement for appearances sake	<pre>for (int i • 0; i &lt; numPypusOfThingsTolant; i • +)  // check for gome ball out conditions</pre>	// bail out it errors if (to a false)	Dreak; // prorect against double initialisation if remains * Enthel		it it user wants to stup.	D. C. C. C. C. C. C. C. C. C. C. C. C. C.	t distance object here, since the group objects v	// are going to create below require this. simpleBatibiscancizer = new CimpleBaticDistance();	TDSSEA 1;CPP 3-24-98 11:24a	**

```
NUL /* code napping file */) -- false) { sprintf(erries) * faror adding simplified Rules to File [fs] . Check to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOS SIMPLIFIED RUES PILE);
                                                                      // now try to encode the rules by harding it the simplified rules
// file. If there are any rules in the rules file that have
// replacement strings not found in the simplified rules file,
// the function will put up a message box.
if (ruleSets[i]-santSimplifiedbales[i]e.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NALL, /* log file, use message box instead */
                                                                                                                                                                                                                                                                                                                   if (logstream != MAL)
    'logstream <= errMrg << endl;
rr = false;
break;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sprintf(en1959, "Brror opening simplified Rules File [Ns].",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ruleSets3V(i) * new RuleSet(rules3VFileNamus(i));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for (int i = 0; i < TDS_NAM_CULTURES; i++)
if (*stopVar)
break;</pre>
rt = false;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rc • false;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TDSSearcher::load/lameData()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TDSSearcher::load3VRules()
                                     else ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      rc - talse;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 rc . true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          rc = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return rc;
                                                                                                                                                                                                                                                                                                       ., iletames(i);
                                                                                                                                                                                                                                                                                                                                                                                                                                                        }
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          700G
                                                                                                                                                                                                                                                                 ., 9 File".
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sprintf(errMsg, "Error initializing IBS Name Classification facility."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sprint(errMsg, "Error reading Rules File [Ns]", rulesFilethanns(i));
if (logstream := NOLL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if ( nameClassifier->get_status() i+ 0 ) {
                                                                                                                                                                                                                                                                                                                            MAS_HISP_CRY TRICKAPHS_FILE_INME.
                                                            HAS CHIN ON TRICOLANS FILE NAME,
                                                                                                                                                                                                                                                                                                                                                                                                       I'MS HISP SN DIGRAPHS FILE IGME,
                                                                                                                                                                           HAS CHIN SH TRICERAPHS PILE HAVE
                                                                                                                                                                                                                                                                                      INS_HISP_CN_DIGNAPHS_FILE_NAVE.
                         DAS CHIN ON DICEARMS FILE NAME,
                                                                                                                                       MAS CHID SN DIGHAPHS FILE NAME.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TDSSEA-1, CPP 3-24-98 11:24a
                                                                                                  NAS CHIN SN FILE NAME.
                                                                                                                                                                                                                                                   NAS HISP GRIFILE NAME.
                                                                                                                                                                                                                                                                                                                                                                 IGS_HISP_STI_FILE_NAME.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ·logstream << errifig << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              simplificedandesFile - fopen(TDS_SIMPLIFID_SULES_FILE, *r');
if (simplificedAndesFile + vMLLA) {
    for (int + 0 : 1 < TDS_MAN_CULTRES; 1++) {
        if (*excpler)

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    *logstream << enthsg << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (logstream != NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (nuleSets(i)->Reader() -- false)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                )
break;
// end of switch
                                                                                                                                                                                                                  rus:: 105 HISPANIC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TDSSearcher::loadRules()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rc • true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1000
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Page 3 of 18

```
initialize
set to AVSLD always, since we always s
(BF dejurement via the single vowel rules), and IND BP_SETE_THERS

(BF adjustment via the Journal rules) and IND BP_SETE_THERS

The pre-trained relations are prefety straight forward, since we can be just offect the value of the prefetshershifted which and one of the latest strained to the Rawket Heevert, the post runder operation is many conjusted, because it involves the use of two landers - a Par Enwist that goes the initial pool, and a final runder that received the names from the Par Enwist Information and all and trained (unamily lower). The Part Enwise is initially higher affictent threshold (unamily lower) and have heave is initially inject; and enter when the case cot and name names that unamily linguist; since we do not work out to appear out any names that unget core or creatively high after their edit distance is adjusted.

We choose the design of a Par Rawket and Flank Rawker to that the Rawker does not read to be concerned flows knowledge of) the PB Bilt Distance calcustion and all of the responding that goes along with it (Rales, etc.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             here we need to examine the culture setting the user has aperitied on the GII. If they have said they want a particular culture, we abould search that culture and MGIM. If they did not specifically request a culture, we should search MRID and the culture the classifier comes up with for the name. Since the classifier might decide the name is not any of the other culture, we might end up searching only MGIM.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // clear out the Barker object ranker large auxiemesThatecumber(Auery, ranker, init (ExcRème (), ExcRème (), "rankerParme, moutement large (easured) is taken entitle (e);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // get rid of the Mis data for the query name (2 culture)
queryfia(0).RemoveAll();
queryfia(1).RemoveAll();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // empty out all the data we collected on the query empty/amendup();
empty/amendup();
query/compt() (clear();
query/coups() (clear();
query/coups()).clear();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     = =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                narrative paragraph number 4.1.1
if ((rc = validateQueryName(qName)) -- true) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // clear out the query stats structure
queryStats.clear();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   queryCultures[0] = TDS_CULT_ANGLO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (querySingVowelVariants[0] :• NALL) {
    delute querySingVowelVariants[0];
    querySingVowelVariants[0] • NALL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (querySingVowelVariants[1] := NUL.) {
delote querySingVowelVariants[1];
querySingVowelVariants[1] = NUL.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         query3VowelVariants(0) * NULL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (querylVowelVariants[1] := NULL)
delete querylVowelVariants[1];
querylVowelVariants[1] = NULL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (query)VowelVariants[0] := NULL)
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For this reason, the caller can request that the edit distance score for each new (that has passed the mer edit distance threshold be adjusted (via a butte force calculation) before it is sent to the ranker. Alternatively, the caller can requise the tranker is take the hast new is sent distance of the calculation of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition of the condition o
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                                                                                                                                                                                                          if (namePilesit) ** NdLi)
sprint(termas). "Excr opening Name file [Ne]", namePileNames(i));
if (logstream != NdLi)
if (logstream != NdLi)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'logstream << endl << 'Query Name ' << qName << ' submitted' << erdl;
if (status -- true) {</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nas::language queryNameLang;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              queryRegEx(1000 • 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for (int 1 + 0; 1 < TOS_NEW_CULTURES; i++) {
    nameFiles(i) = fopen(nameFileshers(i), *tb*);</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            grouptameOffsetsFileNames(i).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   it (groupdacali) -getstatuut) -- false) {
delete groupdatali);
groupdatali - NaLi;
rc - false;
break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rc . true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         simpleEditDistancizer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              groupEditDiscThresh);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         initialize the searcher for a new query IDSSearchor::sukmitQuery(const_char *qdame)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rc - false;
break:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TISSeurcher::lcadGroups()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (logstream !* NALL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            bxol rc • true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 enum
e_tds_culture
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Page 4 of 18

TDSSEA-1:CPP 3-24-98 11:24a

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We must pass the culture that the name was classified as (or specified by the user as. We pass that as the classfulture parameter to the DataName constructor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // now use the single vowel rule set for the other stufff strongs. (LACISTR) ruleSets[culture]->TranslateWord(spaceSQuenyAume))
                                                                                                       // first, use the 3 wowel rule set to build the NFA
strcpy(queryRogBx, (LATSTR) ruleSets3V(culture)->TranslateMard(spacedQueryAhame
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             If we are looking at more than one culture, we should init the ranker with both cultures. Otherwise, just pass the same query name twice.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  initialize the ranker for this new query with the parameters and the query name. We waited until here to do it so that we would have the chance to build the start IPA consonants list and to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // ask the rulus set (single vowel) for the SEC string(s)
// tor the query.
ruleSets(culture)->GetSimplifiedCodeArrayForString(spacedDueryMame.
                                                                                                                                                                                                                                                                                                                                                              if (genQuenyVariantsPor3Vowel(i, culture, quenyRegEx) ** false) {
    rc * false;
                                                                                                                                                                                                                                  // if the want to use 3 youed BF edit distance adjustment,
// need to additionate the 3 years' varies for the query
if ((predanderBHycde -- TTS_B_MCE_THREE)) ||
(postBanderEBHycde -- TTS_B_MCE_THREE))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // the IPA info we will need to pass to the ranker
calcomery[PAInfo(i, culture);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (genQueryVariantsForSingVowel(i, culture, queryRegEx))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // the group strings for the query
computeQueryGroup(i, culture);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           querySEtStrings(i),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  culture . queryCultures[0];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         set the start vowel flag.
for (i = 0; i < numOulturesToSearch; i++)
oulture = queryOultures(i);</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (namOulturesToSearch == 1)
                                                                                                                                                                                queryNta[i].Set (queryRegEx);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (
rc = false;
break;
                                                                                                                                                                                                                                                                                                                                                 narractive paragraph number 4.1.4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        narrative paragraph number 4.1.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  narrative paragraph number 4.1.9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          narrative paragraph marker 4.1.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  narrative paragraph number 4.1.6 narrative paragraph number 4.1.7
                                                                                narrative paragraph number 4.1.3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       =
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "ALS0
                                                                                                                                                            *logstream << "Query Name Onlture specified as " << oultureStrings[spe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       build the Otta object for the query (3 vovel)
Also calculate the query IPA (single vovel) info that we will need to pass to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 just.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // Also, compute the group strings for the query
// Also, ask the rules set (single twel) for the SEC string for the query
// Nece that we do this in a loop since we might have to do it for two cultures.
sprintf(spaceQuerykame, * is *, querykame);
      *logstream << "Query Name classified as Anglo/Default, "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                querylanniang = nameClassifier-vanalyze( querylane ):
if (querylaneLang == nas::HGS_ARABIC) {
queryCultures(!) = TRS_CULT_ARABIC;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // update the query info also queryStats.numblturesToSearch; queryStats.numblturesSearched = numblturesToSearch; queryStats.secondOulture = queryCultures[1];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else if (query/tamelang ** nas::RAS_HISPANIC)
query/Cultures(1) = TDS_CULT_HISPANIC;
                                                                                                                                                                                                                     if (specifiedOulture != TDS_COLT_ARGLO) {
    queryOultures[1] = specifiedOulture;
    namOulturesTDSearch = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (querytamelang •• nas::NAS_CHIRESE)
queryCultures[1] • TDS_CHIT_CHIRESE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mumblturestoSearch = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            membulturesToSearch = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   munculturesToSearch = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .> searching " << cultureStrings[TDS_CULT_ARGLO] << endl:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .. searching * << cultureStrings(TDS_CULT_ARGLO] << endl;
                                                                                                                                        if (logstream !. NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           eStrings(queryOutures(1)) << endl <</p>
                                                                                                                                                                                                                                                                                                                                                                                                                                                               narrative paragraph number 4.1.2
                                        ::::
                                                                                                                                                                                                                                                                                                                                                                                                                                       else
                                                                                                                                                                                                 .. cifiedOulture) ** endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ::
                                                                                                                                                                                                                                                                                                                                                              .. tol .. endl;
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TDSSEA-14CPP 3-24-98 11:24a

Page 5 of 18

false,  (exact metch (N/A)	•• 11.	culture,	pipe culture index     // pipe culture index     ranker.init(overNAmmCD)secForBankerCulti.		rankerParms, muckamesToBecumibetQue	featureDistanceTable); // ??? stould get this from edit dist object	// intialize the far ranker just like the final ranker, but adjus	// threshold and max names to make it fat if (postRankerBPRode !• IDS_BF_ACDE_NAME) {	farParms serThresbold (farBarkerThresbold); // init the Par Ranker object	talkaiver. Jin t (queryware, Djectronaiver.)	,	*> dDistanceTable); }	// if there is a warch name, reset the associated variables if variables(): if variables():	distriction (1818) shouldwasterplatinise - false; distriction (1818) distriction (1818) distriction (1818) distriction (1818) distriction (1818) distriction (1818) distriction (1818)		// note here that we have not processed the fat ranker results fatBankerProcessed = false;	<pre>else {     print(lertWag, "TDSGearther has not been successfully initialized");     if (logstram : MJLJ)</pre>	'logstream cc ettring cc erdl; rr • false;	retum rc.	bool TDSSearcher::validateQueryName(corst char 'qukame) {
else oulture • queryOultures(11);	BotRiene queryklaneChjectForRanketOutl (queryklane,	0, // edit dist score (N / A) // edit dist score (N / A)	queryStartIPAChars(0),	querystartVorelFlag(0),			// name code (U/A)		// pipe culture index // narrative paragraph namber 4.1.10	<pre>1f (nunOulturesfDSearch == 1) {</pre>	o erOult), // just repeat it 'raukerParma'.		// inclairs the fact cancer just increment and max names to make it fat // threshold and max names to make it fat If (possibadershouse : TSS just PODD JUSS) ( If Wharmaters fatharms - trabstburms;	fatParms.setThreshold(fatBanNerThreshold);  // init the Par BanNer object fatBanNer init (queryNameObjectForThanNerChit), queryN	and Angel grant and a second an	* of idiantinudums.  * of idiantinudums.	ExtNormer queryNormeObjectForBankerOult2(queryNorme, )/ qrume	o, 0, 4	queryStartIPADars[1],	quen/StartVowelflag(1).

TDSSEA 1:CPP 3-24-98 11:24a

Page 6 of 18

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culture;
exactMatchCandidateOffSets;

    queryStats.numlamesThatMat

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // now go through each of the candidates and retrieve the data
// at the specified offset. The function gentwoutboalmouste vill
add the name data to a map if it passes the exact much comparison ,
for (exact/virinf) control/foreities - society-distributes offsets - shegin();
control/foreities - exact/virinforeities - back/virinformidiateOffsets - end();
control/foreities - back/virinformidiateOffsets - end();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // store in the query into the many names were brough back because they may a group that matched the query's group exactly. The party is group exactly querystars inthemselfinbackstonicoupill a coacteacthyconicotectic and
                                                                                                                                                                                                                                                                                                                                                                       narrative paragraph nates 4.2.1.

// Ask the GroupChai dipject for the offsets of names that produce

// A group that matches one of the query's groups exactly.

// Offsets aim the Nameboc file.

exactNatchCartichariotec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (irc) {
    if (logstream i= NALL) {
        if (logstream i= NALL) {
            collumeStrings[culture]
            cc. Culture cc. Culture cc. Culture)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // get rid of the offsets, now that we have looked at them
delete exactMatchCandidateOffsets;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // first or second culture to search? (0 or 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             groupData (culture) - >getNameOffsetsOffbractG
                                                                                                                                               if (logstream !- NIL)
*logstream << endl << 'Starting Exact Searth' << endl;
                                                                    exactMutchOffsetIter;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 narrative paragraph number 4.2.2
if (getlamaAndEvaluate(*exactMatchOffSetIter,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               delete exactMatchCandidateOffsets;
                                                                                                                                                                                                                                                             for (i = 0; i < numOulturesToSearch; i++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TIDS_FROM_EXACT_SEARCH) -- false)
                                                                                                                                                                                                                                                                                                                    culture - queryOultures[i];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (rc && (*stopVar =* false)) {
                    e_tds_culture
set<ursigned int>
set<ursigned int>::iterator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (*stopVar) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    •> heiBactly(i) << endl;</p>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .> ly (phonetically): *
                                                                                                                                                                                                                                                                                                                                                                           >
                                                                                                                                                                                                                                                                                                                                        while (!cdptr) := '(a) {
   if (isalpha('cdptr) := '(a) {
      if (!cdptr) := '\'') {
            atrqy(errdsg, "Query Namm must contain only letters or an app
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (isribanquerykame) ** 1) {
strcpy(errbsy, "Query Name must be greater than a single character");
if (logstream |= NULL)
if (logstream |= NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TIDS MAX NAMED);
                                                                                                                                                                                     so we wont have to do it again
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (logstream t= NJLL)
*logstream << entMsg << entdl;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            make sure query is > 1 (we do not support initials);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TDSSEA 1.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             *logstream << "Blank query Name specified" << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  *logstream << errMsg << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                do the exact caexch. This means doing a binary search of the groups file, and grabing the names associated with the groups that makel his query sugues each! Luckily, the groups adject is capable of returning this set of name offsets. We mad go through this set of name offsets, retregive the man at the specified offset, and see lusing the 1% rules) if this name is an exact phontic mach with the query.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \{ sprintf(erring, "The Query Name can be no longer than {\sf Nd}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                strcpy(errMsg, "You Must Enter a Query Name");
if (logstream (= NALL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rc = false;
break;
                                                                                                   logstream << errMsg << erdl;
                                                                                                                                                                                                                                                                rc • false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             chPtr++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             it (logstream != NULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rc . false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        )
// mak
if (rc) {
                                                   cds_strip((char *)qName);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          }
else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   )
return çC:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           bool
rc • true;
int
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .. stroppe");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      elsė
3
```

Page 7 of 18

stopvar // store the query into for this portion of the search queryStats inucropsObeckshibitLities [i] = groupbis (putter) - spetkmicrops(i); queryStats inucropsWhatesackirops(i); a micropsWhatesackirops(i) ii = nanGroupsWhatesackirops(i); iii); a micropsWhatesackirops(iii); iii) = similarescriptCandidateoffsets - saize queryStats : numbraidatebusStatriveoffromSimilarSearchii); a similarescribandidateoffsets - saize **Enum**Gro // now go through each of the candidates and retrieve the data
// at the specified offset. The function getken-bushorbushes will
// add the name date to a mp if it passes the exact natch comparison
for (similarMatchOffsetTer \* similarMatchOffsetCandidateOffsetCandidateOffsetChooling):  $groupData \{culture\} * \times getMameOffsetsForGroups \{queryGroups \{i\}\},$ // Ask the Groupbate object for the offsets of names that produce
// a group that matches one of the query's groups exactly.
// offsets aim to the Nameker file.
marstive pusgraph names 4.3.1. ??? here is where we would calculate if the warch name should be considered a similar match condidate based on its groups (Does any of the groups the worth name produces with a score so the threshold?) the groups the query name produces with a score so the threshold!) // Note that we use a different ranker depending on the value of the profile profile the varieties or varieties the adjusting the dit distance of the names after the ranker has worked on them, we should stamic names to the Par Ranker. Othervies, we should stamic names to the Par Ranker. Othervies, we should first and the cost fitnal ranker. (Othervies, we should it (postBanker) is TES PHOTE (ATS). // first or second culture to search? (0 or 1) (getNameAndEvaluate(\*similarMatchOffsetIter, similarMatchOffsetIter++) \*logstream << "Starting Similar Search" << endl; if (\*stopVar) {
 delete simularMatchCardidateOffsets;
 break; for (i = 0; i < numbleuresToSearch; i++)
culture = queryCultures(i);</pre> TDS\_FROM\_SIMILAR\_SEARCH) ... (alse) similarMatchCandidateOffsets = rc . false; narrative paragraph number 4.3.2 rankerToUse - Lranker; .>
upsThatPassedGroupEditDist, if (logstream != NGLL) :::: ë ₹. culture;
\*similarMatchCandidateOffsets; intrative production that et al. 4.

near\_secord\_map(::iterator map(ter;
map(ter - names)4p, begin()

(or inap(ter - names)4p, begin())

map(ter - names)4p, begin();
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map(ter - names)4p, begin();
map(ter - names)4p, begin();
map(ter - names)4p, begi we can skip alot of query name processing, since that was already done. Look at all the groups, rather than using a binary search. We blook at all the groups, rather than using a binary search are not we not at needs we do an edit distance rather than an exact promettic metch comparison. Note that we use the final ranker here no matter what, because exact matches do not need to have their edit distance adjusted. Therefore we can go straight to the final ranker with them. now we have done exact lookups for both cultures so we should go through the spot of Nemekacords and send the information to the Ranker.
Each Nemekacord in the engo can represent 1 or two cultures. It is now represents two cultures, we read to send both sets of into the separate broughters, we read to send both sets of into the separate brothers. \*logstream << "Processing stopped due to errors" << endl; \*logstream << "Exact Match Search Completed" << endl; tunction to do the second phase of the query. This involves searching introget each record in the group filts an particular particul After we have done this for the cultures we are suppose to, we go through the NambScord map, and tell each immeRacord to submit itself to the Bankor. However, since the NambScord map along itself contains couch matches, we should make sure we skip those. similarMacchOffsetIter; Note that the code for this function is very similar to the so it can decide which one is better. man3roupsThat PassedGroupEdit LDist; TDSSearcher::searchforSimilarMatches() e\_cds\_culture set.unsigned int> set.unsigned int>::iterator if (logstream !\* MALL) {
 if (rc \*\* false) doExactSearch, except that: ::: recurn rc; rc . time; 8 in

Page 8 of 18

TDSSEA 1.CPP 3-24-98 11:24a

```
if (checkBactBhorNotch(originalName, cultume, queryCultureIndex))
    (queryStats.numNamesThatMatchedBactly(queryCultureIndexl)+++;
    addNameIndameRecordNup = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // if we are here from the exact search, do a check to see if this // is truly an exact match. If so, add the name to the ranker with an // Estiblist some of 1.0. If not. bag it. if (exaluation/etbd = TD_ROW_EXACT_SEARCH) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     editDistScore = TDS_EDIT_DIST_SCORE_FOR_EXACT_PHON_MATCH;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 narrative parogram number 4.2.2
TISSearcher::getismeAnffValuate(int offset inkmefile, e_tds_culture culture,
                                                                                                           Note that queryCultureIndex is the index (0\ or\ 1) into the query specific data, while culture is the index (0\ \cdot\ 1) into the names, group, etc for all of the cultures.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (getWameDataFtrmFile(nameBhtryOuf, offsetInWameFile, culture))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                namebit ny Bul (TDS_MAX_NAME_BNTRY_LEN + 11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // check for the watch name
if (!stricmp(watchName, originalName))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       addhameToNameRecordMup - false;
                                                                                                                                                                                                                                                                          int queryCultureIndex,
                                                                                                                                                                                                                                                                                                                     int evaluationMethod)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    exactMatchFlag = 'Y',
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            unsigned char
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          el se
Name string
Start Yowel Flag
starting IPA cons
RDC String
                                                                                                                                                                                                                                                                                                                                                             unsigned char
bool
bool
char
float
                                                                                                      // delete the set of offsets for this culture, now that we are done with them
delete similarWetchCardidateOffsets;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tead the name entry from the file for the specified culture and check to see if we should abt in to our list.

This method is called both from the exact match and similar match sauches. The method used to evaluate the name is different for each search type. For the Exact metho, we should use fib 70 into 10 determine search in the name is an exact phonesic match with the query. For the Shmiars exact, we pass the name's SEC string, along with the query's SEC string,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TDSSEA 1.CPP 3-24-98 11:24a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  *logstream << "Processing stopped due to errors" << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // if we are doing pout ranker edit distance adjustment,
// adjust the edit distance of the names that are in the
// tat ranker and submit tent to the final ranker
if (postRankerBhrobe i- TTG BF.PDCB_HARB)
processPatRankerBesults();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               *logstream << "Similar Search Completed" << endl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            it thure was a problem, set the status so that the error will be reported when we post the message to update the GMI. Also, this will prevent the second
                                                                                                                                                                                                                                                                                                                                                                                                                                            narrative paragraph number 4.3.3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   phase from executing.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (rc .. false)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             - NULT)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             it (logstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                               >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    *****
```

(4 byte unsigned integer)
(7 byte (6 \*MLL) string associated with the name)
(varying length char \*, MLL terminated - max of 30 \* 1)
(single character of 'Y', 'W' or 'B')
(varying length, MLL terminated - max of 30 \* 1). (varying length unsigned char \*, NUL terminated)

The name entry in the names file is in a specific format, as follows:

distance threshold.

it (logstream :- MALA) . (
'logstream cc 'Oulture ' cc cultureStrings|culture)

cc ': Names that passed similar edit d

<< cultureStrings[culture] << " " "
<< queryStats numburesThatPassedSimila</pre>

.. rEditDistance[i] << endl; .. istançe for culture \*

addNameToNameRecordNap; exactMatchFlag; editDistScore;

deserving.

## Page 9 of 18

bag it

>

dicMatchNameExact - true;

ing (san)	<pre>(ursigned char *)dbsBCScring); if (editDistScore &gt;* nameEditDistThresh) {</pre>	â	
	(queryStats.numthamesThatPassedSimilarEditDistance[queryOultureIndex]);	:	edithistScore);
	additarefolkmeRecordiap = true;		
			else if (prekankerBPMcde •• TDS_BF_MCDE_TRREE) {
	// Check for the watch name (* ('erricms/tamphilams orders))	,	<pre>if (threeVowelVariantsTrunced(queryCultureIndex) == false)</pre>
	didbackteneEditDist • true;	-	edic Dies Cours - ral o Worm Britand of any and an incident
		-> arre,	י בייייייייייייייייייייייייייייייייייי
	- additumeTCANameRecordNap • false; // bag it	•	-
-		:	queryCultureIndex,
"	if we should add this name to the map	î	
it (o	if (udditum:TokemeRecordMup) (	•	culture,
	// up the key. If we do find an object, we should only add this rame	•	
	// if either:	:	editDistStore);
	// the name already in the man is not an exact match		-
	او		
	unsigned int ' name(d)		Numsecord * templameRecord * new NameRecord(originalName, startConsonants
	unsighed char	. , startVowelflag,	
. crart/framilfilan		i	
	ii.	as recore exactMatchFlad culture	edithis
DESCT.	dbSKLan * strlen((char *)dbSBCString);		
	Char		popular
hamelode;			
	1		numesMap (name id) - tempManeRecord;
	// paise the theids in the name Dutter nameId = 'Unnsigned int 'DowneDutrePair'	- 1	
	named of the constitution	9519	
	startVowelFlag = (thankActoring (Aktoring Aktoring	// nume is already there. Since we do exact match checks for all culture	
	startConsonants = dbSECString + dbSECLen + 2;	71 44	// Pefore doing similar match chanks and an avant match allows bases a
		•	
	// Or Similar), or // it is not not be about moth almost be not not addition		
			// data (scores, start cons, etc) to the ranker to see which one gets
	add the name, since nothing		// the overall ingrest score.
	pfter		// The following situations are possible:
	if (mupiter == namesMup.end()) {		:
	// and add it to the map.	•	// Extracting Name to be added Action
	// first, see if we are subcosed to do some edit distance adjustment on t		// andio form avair
2		÷ 0;	Cant Ramen - name net looked at only one
	// edit distance score $\frac{1}{2}$ If we are supposed to do an adjustment, make sur	., per method	
υ 1		· ·	// angle from exact angle from sim
٠	// if this is an exact mutch, skip the adjustment	** 110t	Don't add
	if (exactMatchFlag i* 'Y') (	.> m exact	Add
	if (preRankerBFMode ** TDS_BF_MODE_STRULE)		// anglo from exact other cult fro
- :	<pre>if (singVowelVariantsTrunced queryCultureIndex) ** (alse)</pre>	-> m similar	
- 1	edicDistScore - calcSingVovelBruteForceEditDist(origin	2	anglo from similar  Cant Huppen - we do all exacts before similars
	TDSSEAT1.CPP 3-24-98 11:24a		Page 10 of 18

queryOultureIndex,

::

```
sprintf(erriting, "Error reading to bytes at offset to from names (ile ts", offset.inNameFI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (logstream |- NALL) {
    'logstream <- "Error Looking for a Name in the names file' << erul)
    'logstream << errors config.</pre>
                                                                                                                                                if [bycestead := IDS_MAX_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener_gener
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (logstream : MILL) {
    interpretation (or a Name in the names file" <= end);
    ingstream <= erring <= end;
}</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if ((aThresh > 1.0) || (aThresh < 0.0)) {
    sprint(lerrHeg, "Invalid Name Edit Distance threshold N", aThreah);
if (logstream (* MJL))</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sprintf(errysg, "Error seeking to offset Nd in names file Ns",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        clearerr(nameFiles(culture));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TDSSearcher::setGroupEditDistanceThresh(float aThresh)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IDSSearcher::setNameEditDistanceThresh(float aThresh)
                                                                                                                                                                                                                                                        and that we reached the end claims in wins a work case estimate if yeth is variable. If we have should clear the eof flap so if we now have reached the end if the nor have reached the end in the claims if (teed (namefiles (culture)))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           *logstream << errMsg << erdl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nameEditDistThresh = aThresh;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               rc . false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .. le, nameFileNames[culture]);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       rc - false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           rc • false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              rc - true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .> s[culture]);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -
else
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   700 J
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                                                                                                                                                                                                        other cult from simila
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              other cult from simila
                                                                                         other cult from exact
anglo from similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // other cult from exact other cult from exact Cast Mappen - name yet chooled at only once per culture per meltin control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control of control
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anglo from exact
bor't add
anglo from exact
or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           other cult from similar
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              anglo from exact
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // cohe cout from similar anglo
Cant impre- we do all exects before similars
// coher cult from similar
Cant impre- whylo spece from similar
Cant impre- whylo spece from similar
// other cult from similar other
// anglo from similar
Cant Happen
// anglo from similar
Cant Happen - we do all ecacts before similars
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                                                                                                                                                                                                                                                                                                                                                                                                  other cult from exact
Cant Happen - Anglo gets done first
other cult from exact
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Cant Happen - we do all exacts before similars of cher cult from similar of Cant Happen - name gut locked at only once per culture per method
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         other cult from exact
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Don't add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Don't add
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Dan't add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Don't add
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return rc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .> m similar
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TDSSEA-1;CPP 3-24-98 11:24a

if (toeck(numwFiles(culture), offsetInNameFile, SEEK\_SET) == 0) {

Page 11 of 18

if ((aftresh > 1.0) || (aftresh < 0.0) {
 sprint(errey-'irvalid Group Bilt Distance threshold Nf', aftresh);
 if (logitean !: Nil.)
 if olditean < errib;</pre>

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